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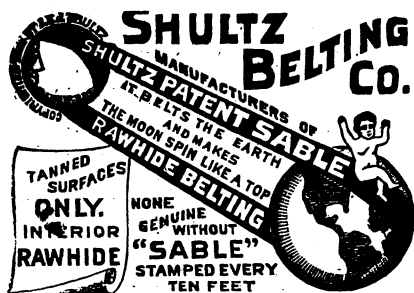
A Review of the Hardware, Iron and Metal Trades.

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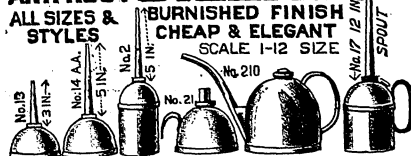
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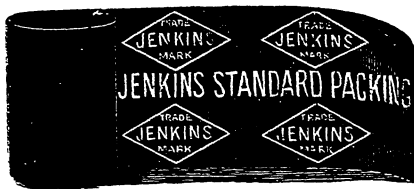
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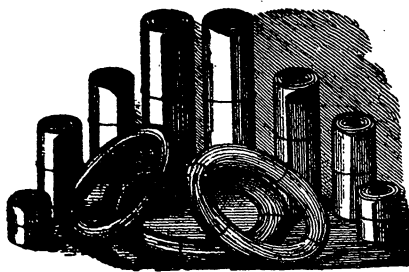
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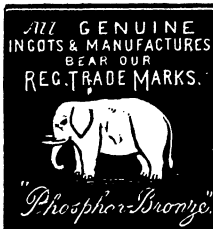
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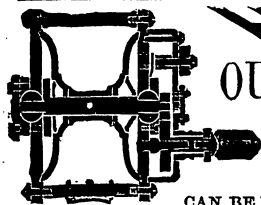
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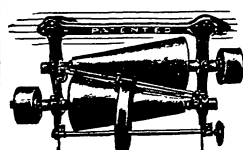
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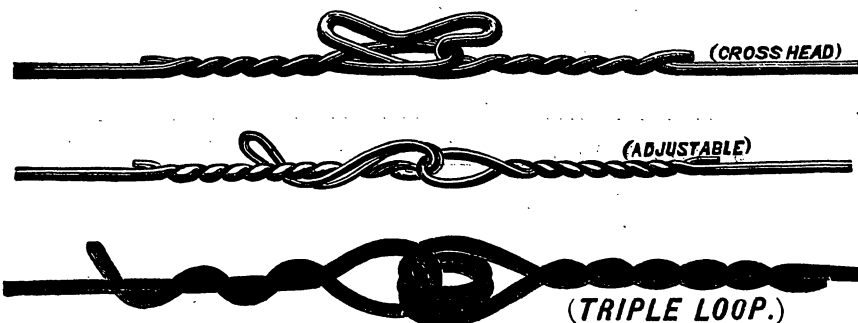
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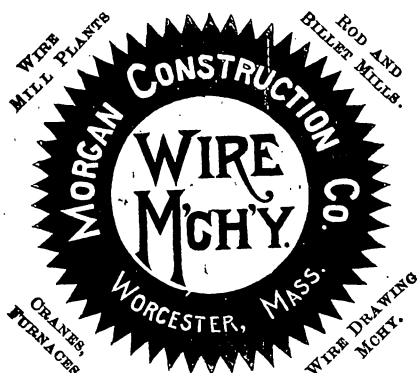


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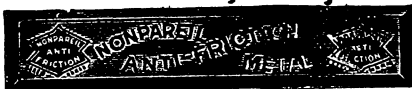
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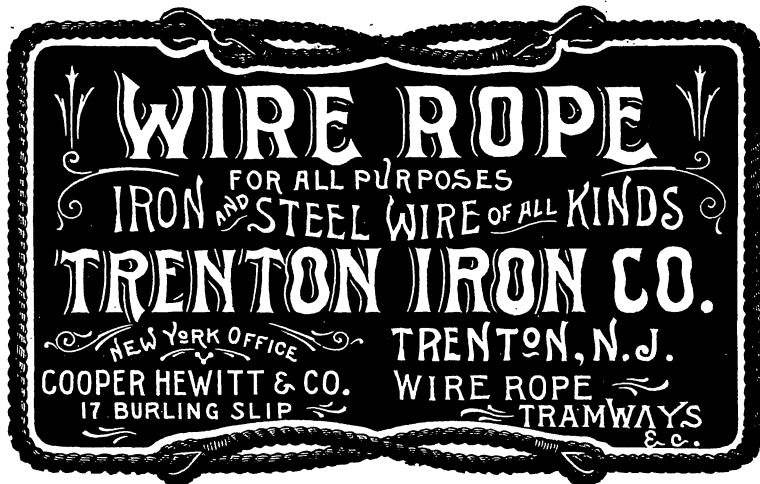
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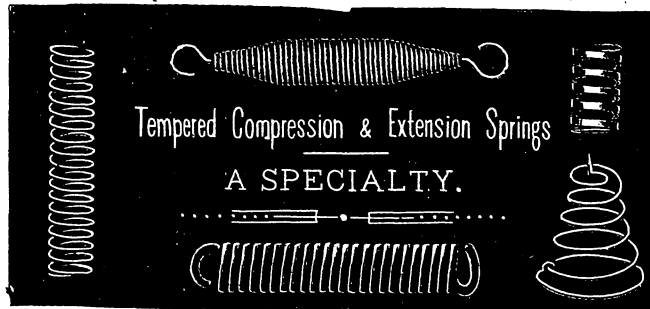


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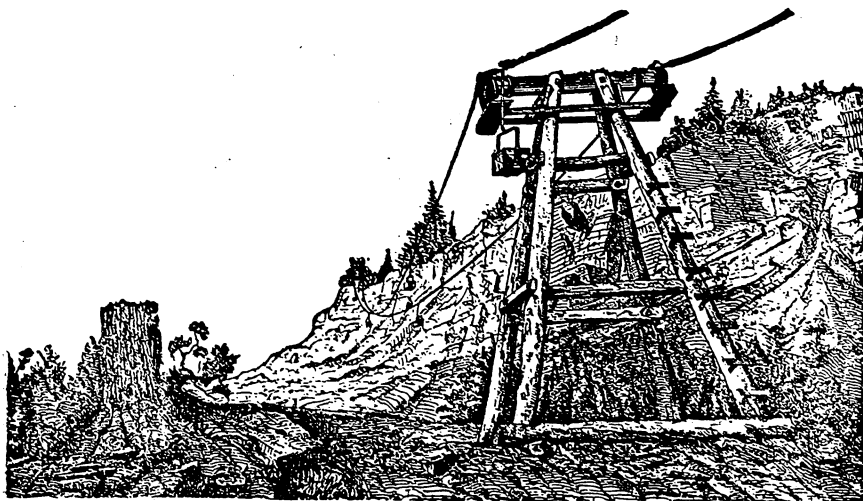
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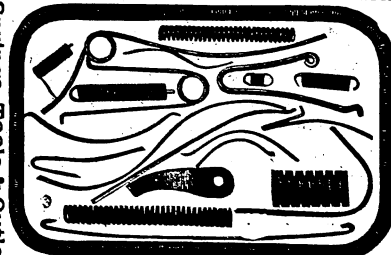
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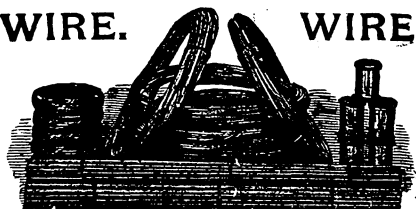


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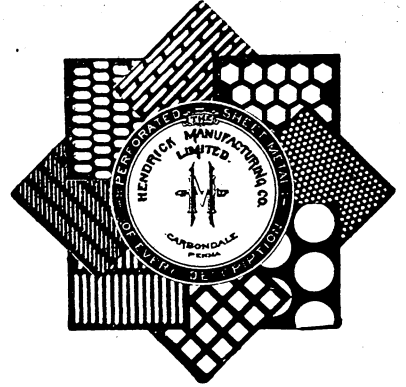
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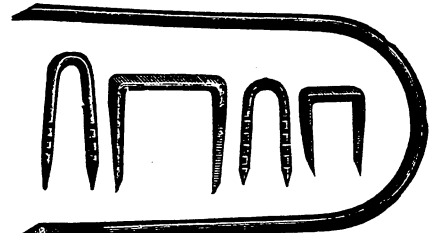
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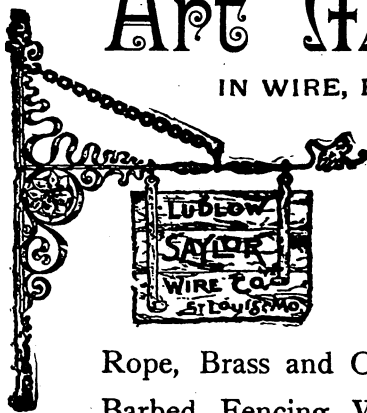
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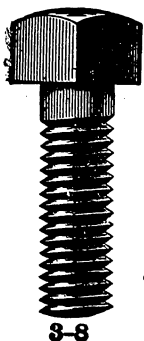
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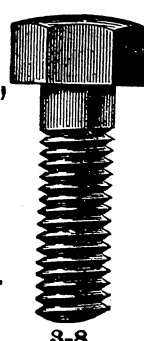
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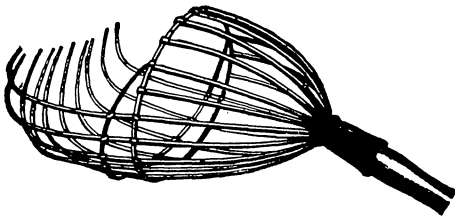
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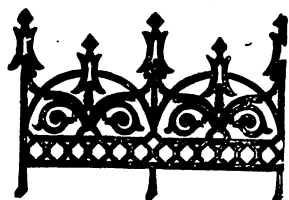
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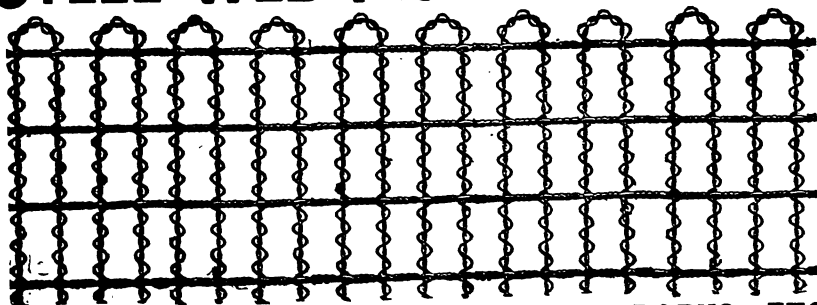
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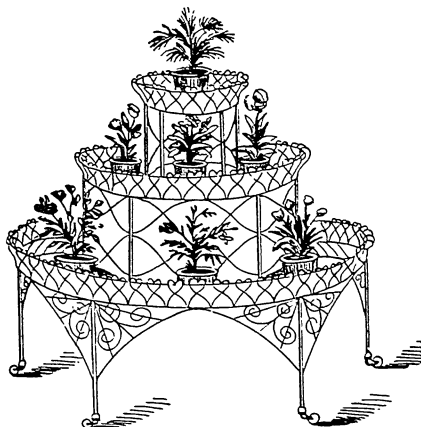
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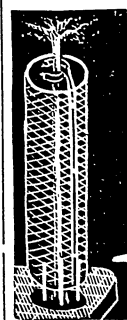
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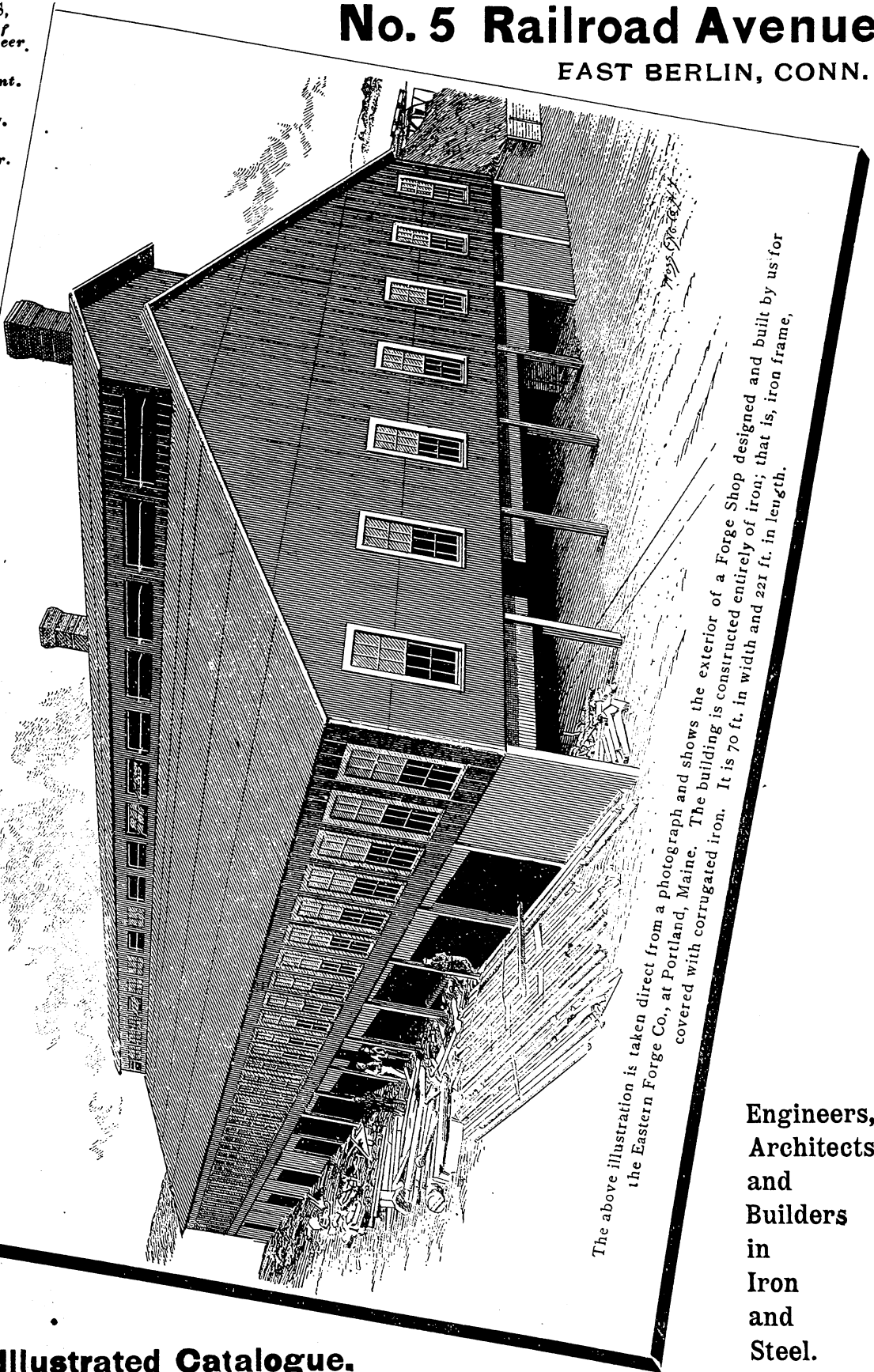
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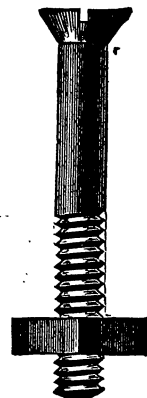
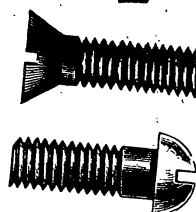
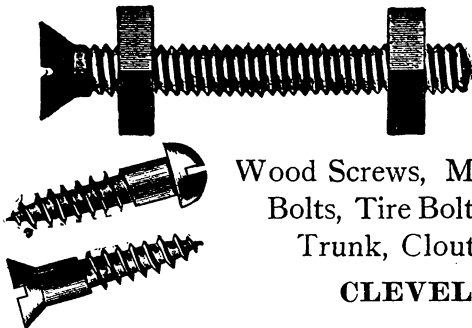
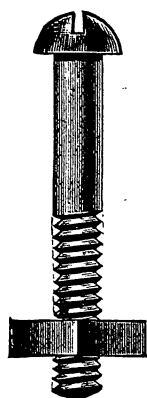
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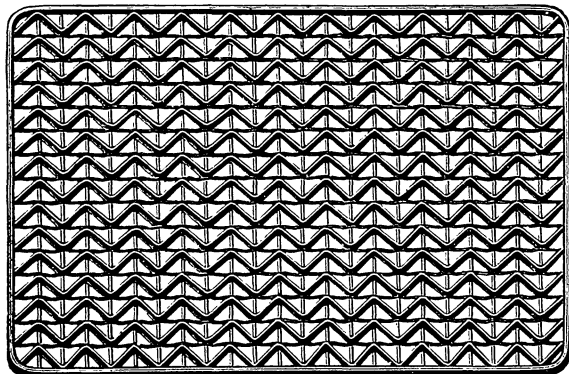
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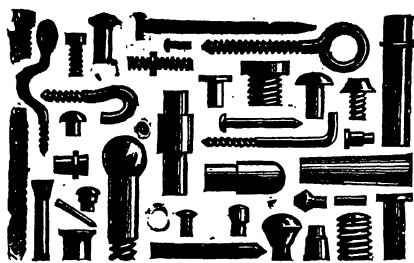
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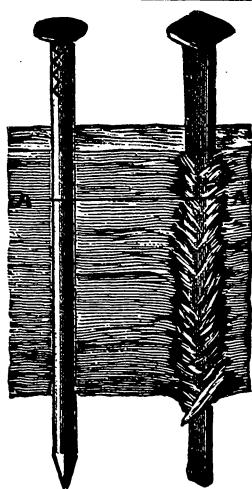
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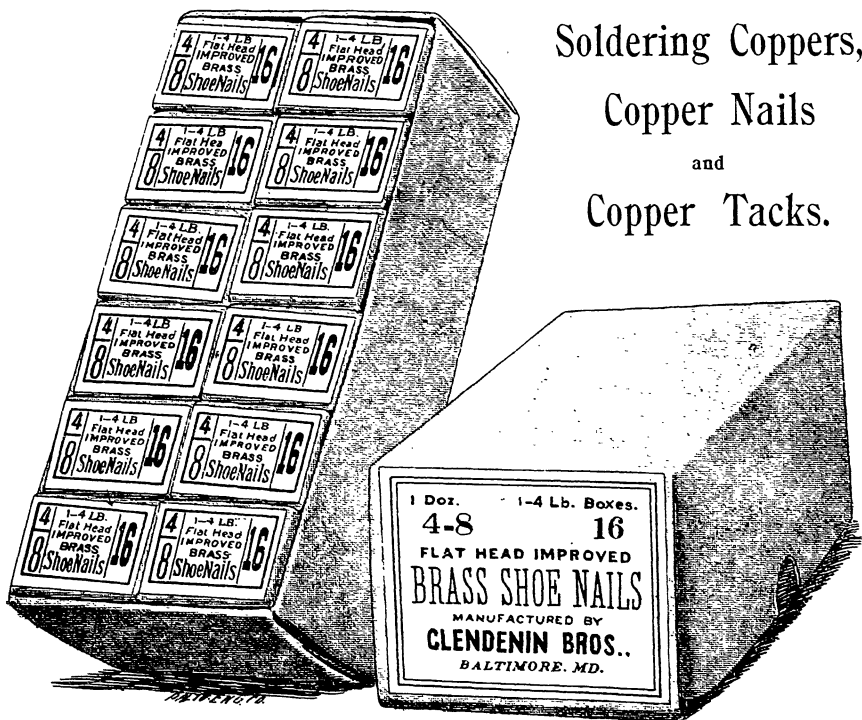
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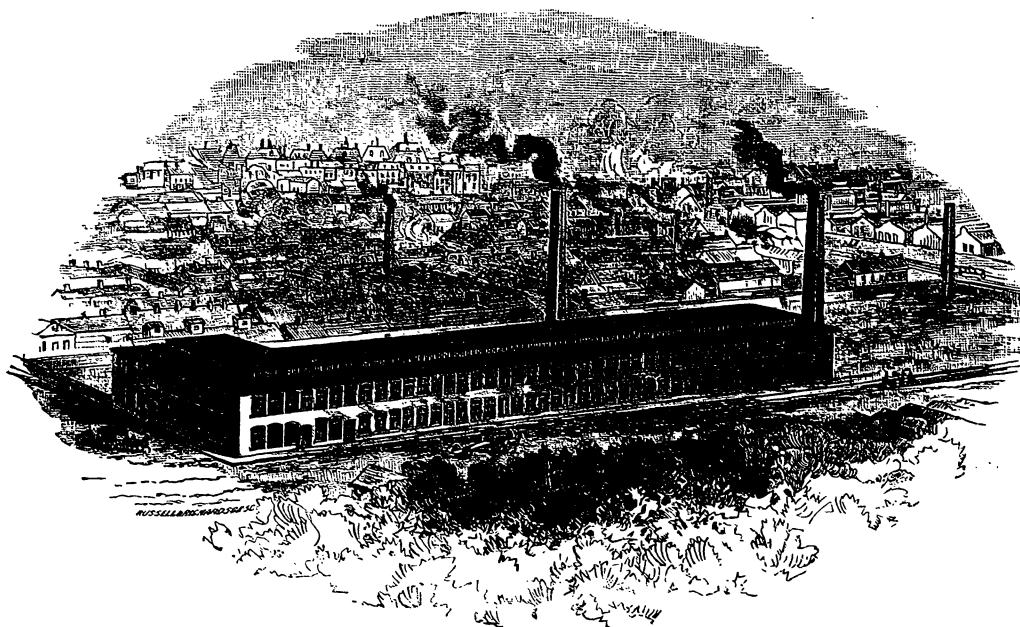
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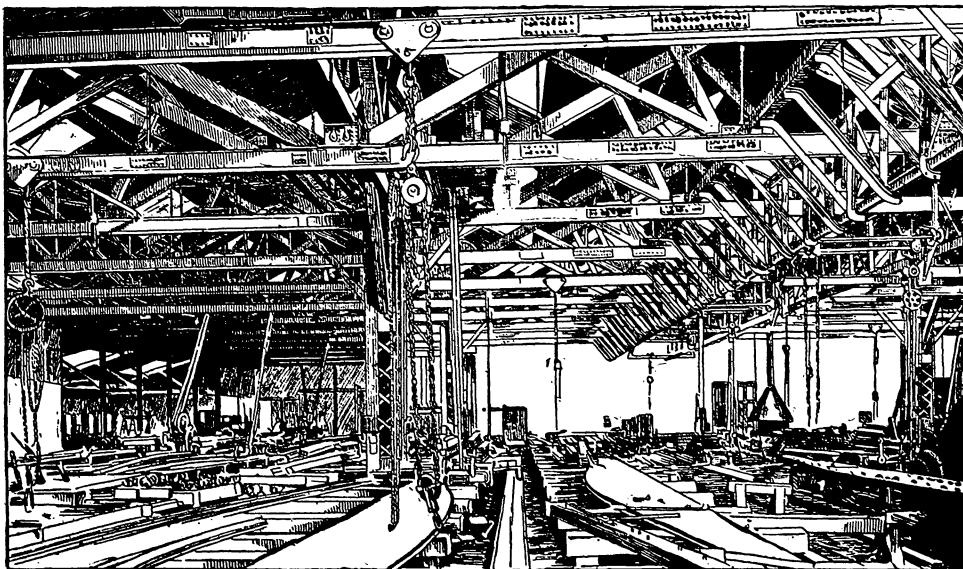
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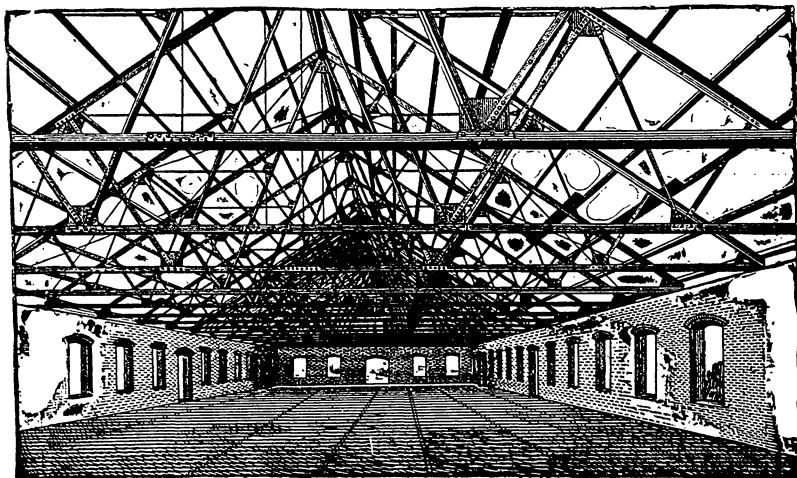
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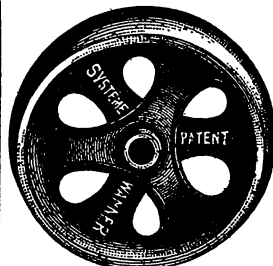
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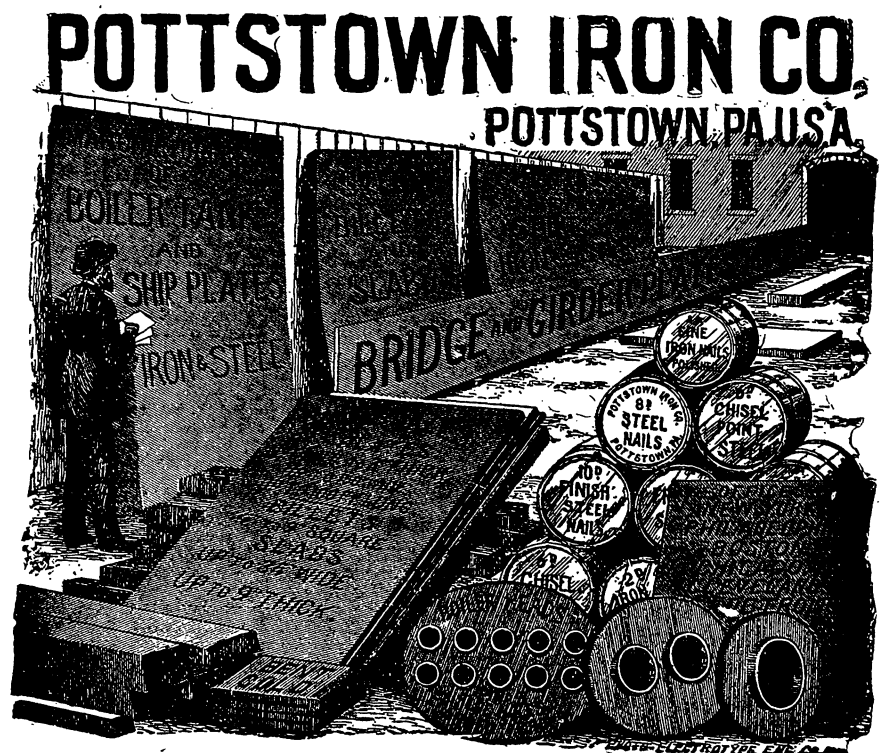
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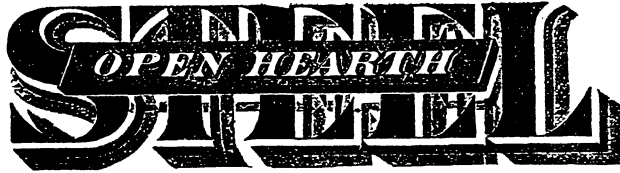
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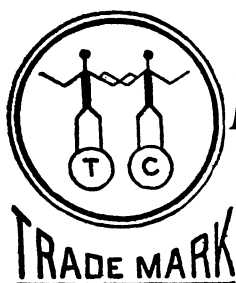
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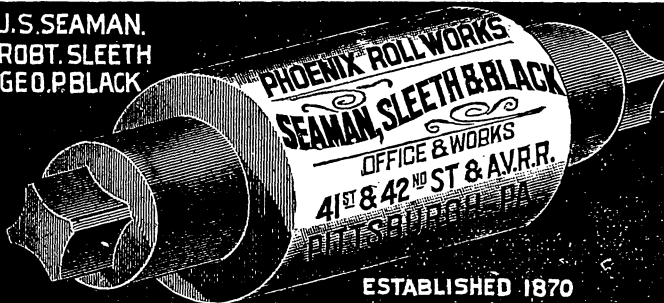
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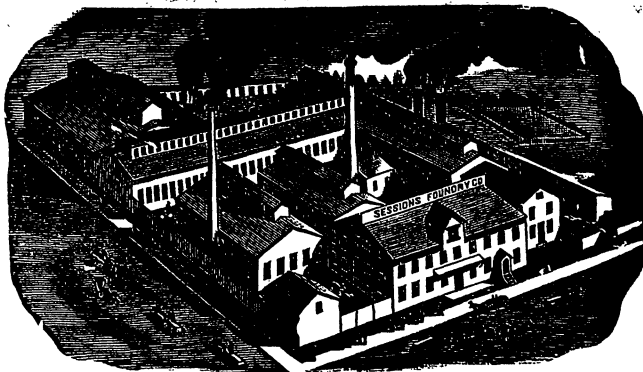
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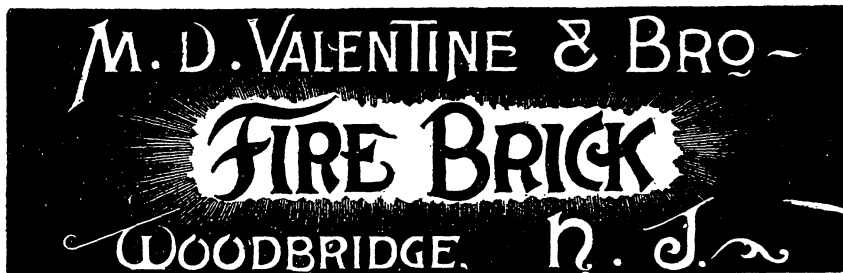
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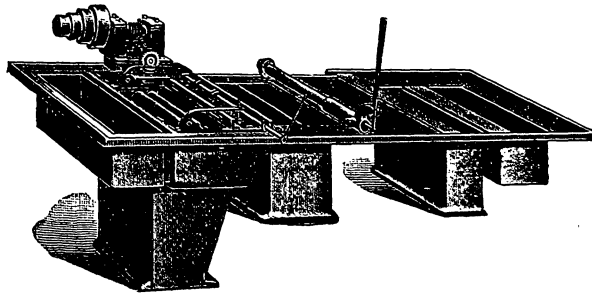
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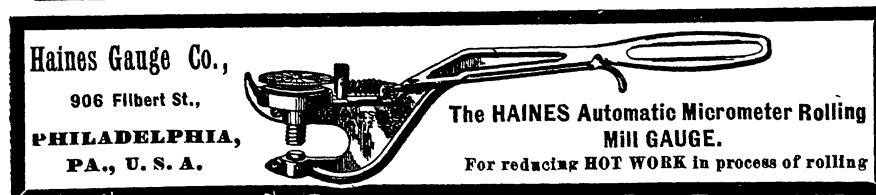
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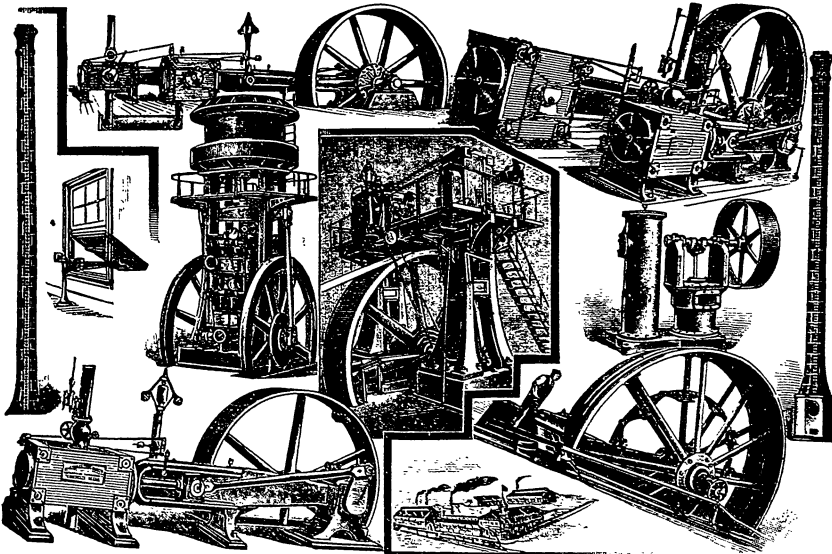
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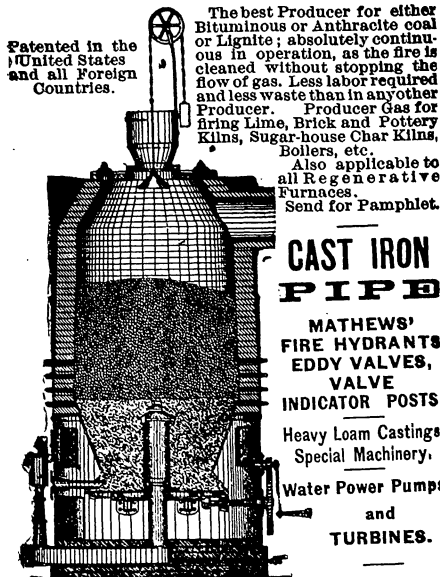
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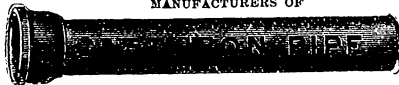
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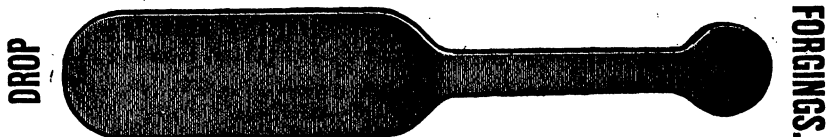
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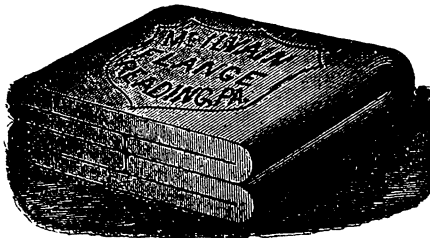
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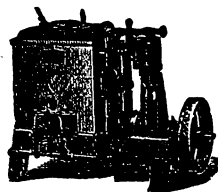
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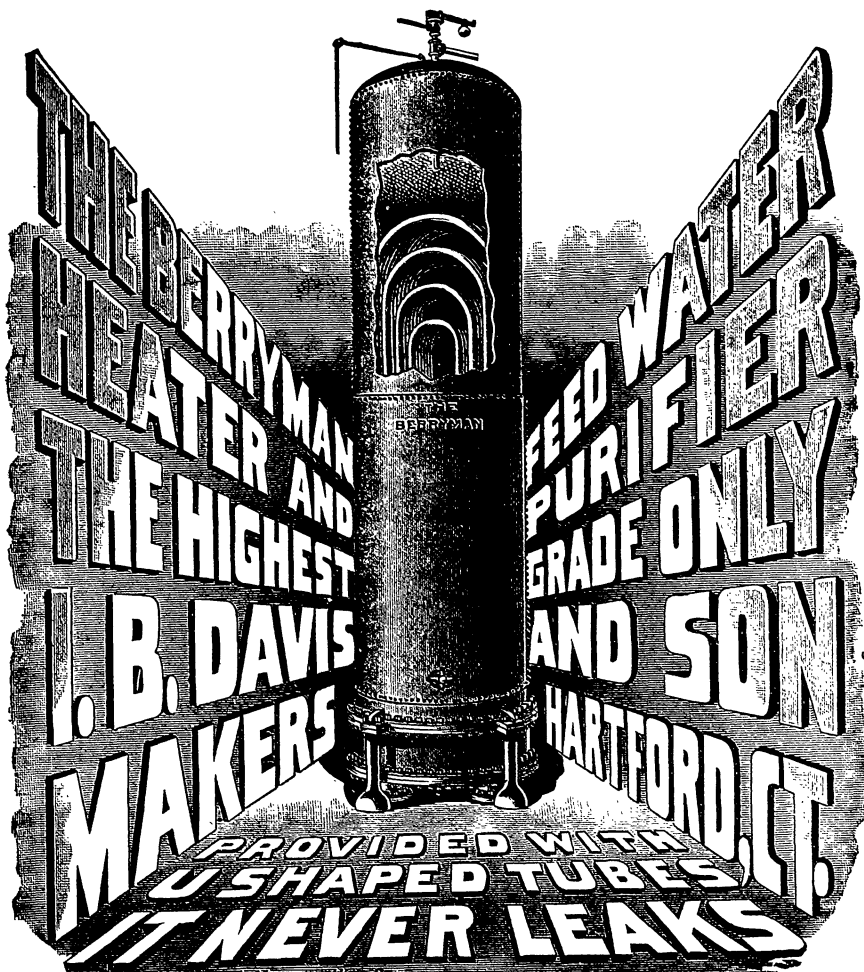
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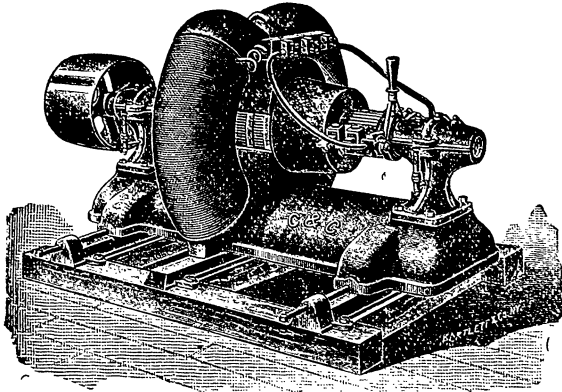
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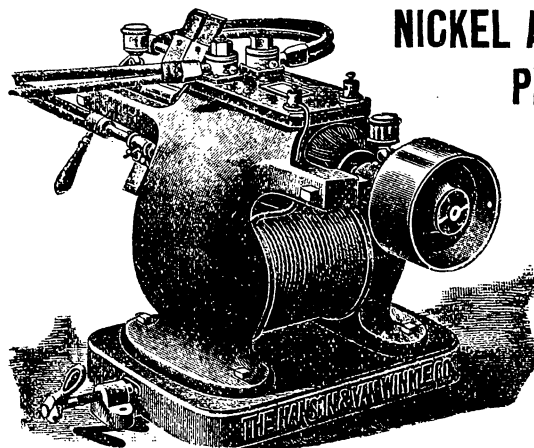
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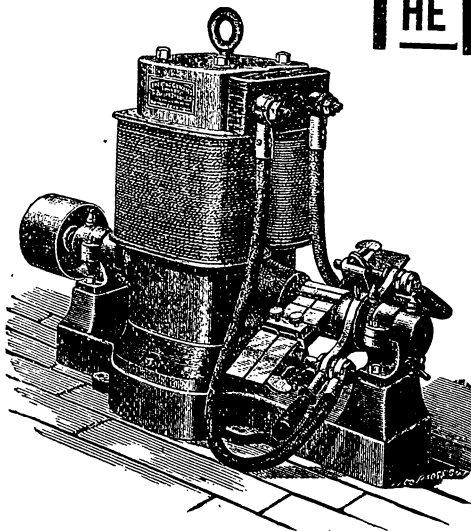
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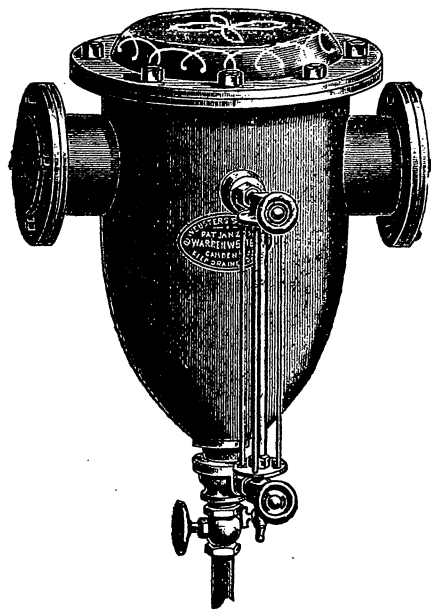
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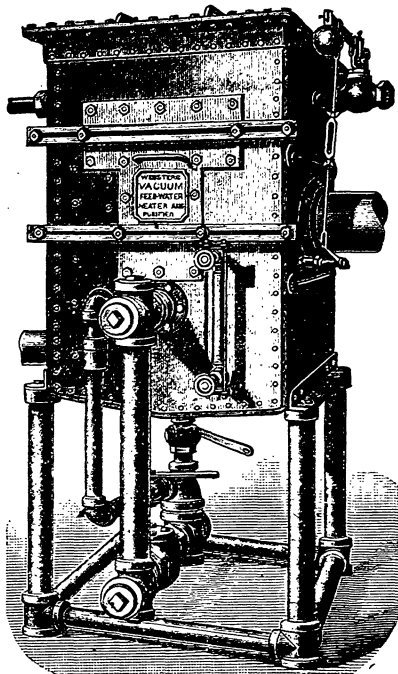
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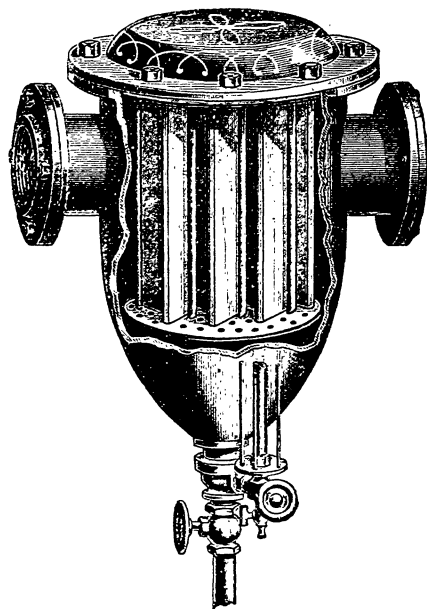
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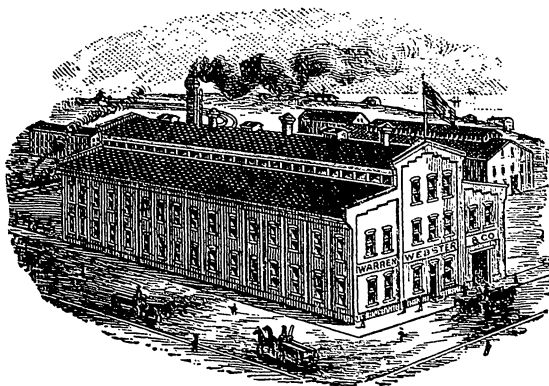
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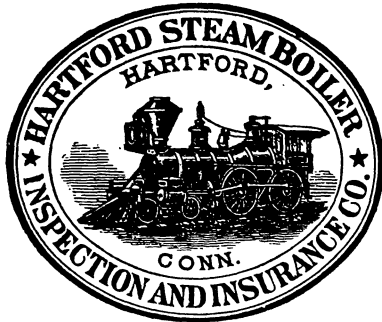
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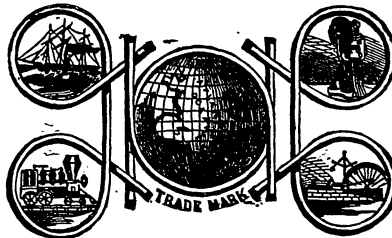
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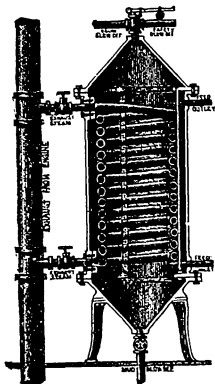


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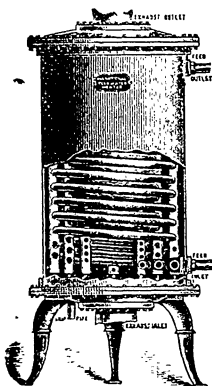
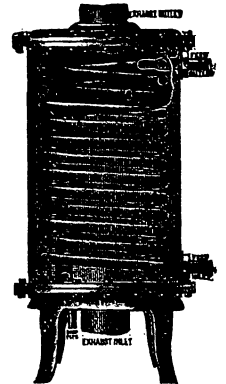
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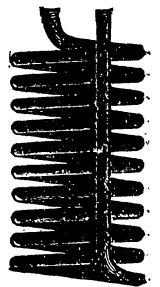
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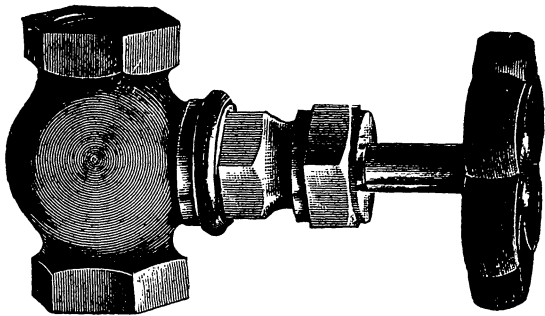
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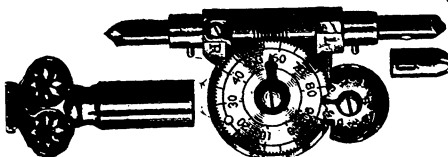
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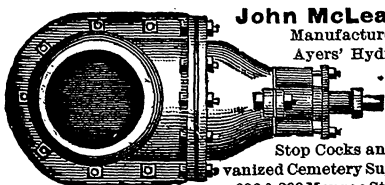
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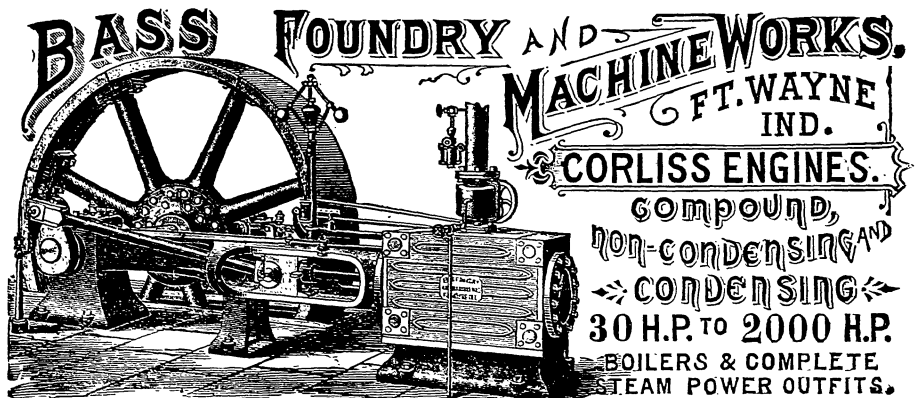


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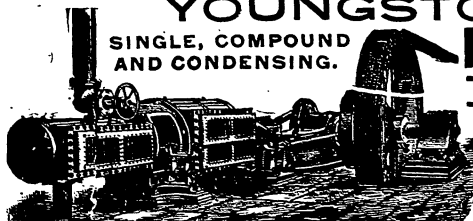


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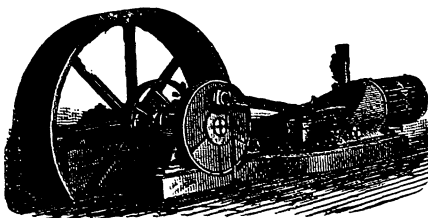
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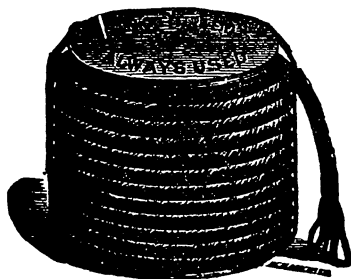


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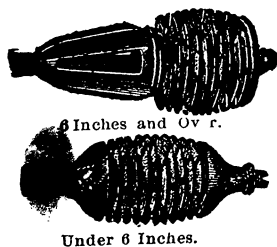
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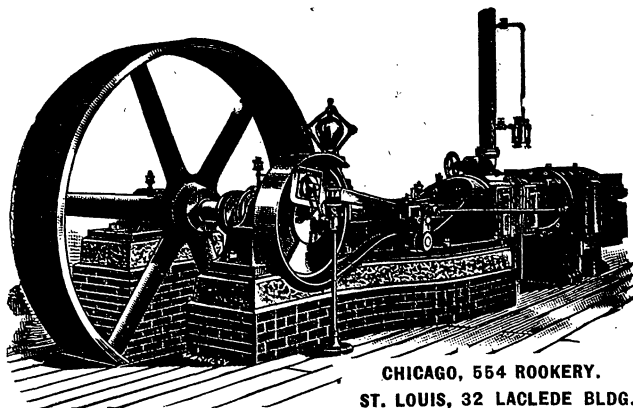
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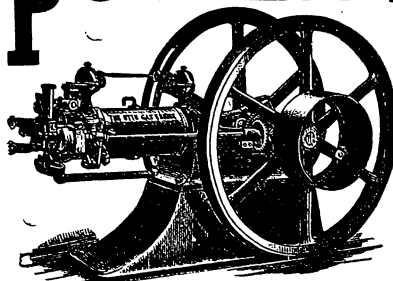
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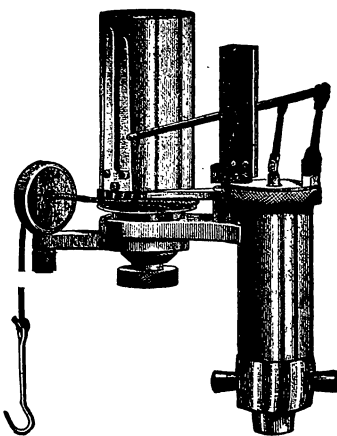
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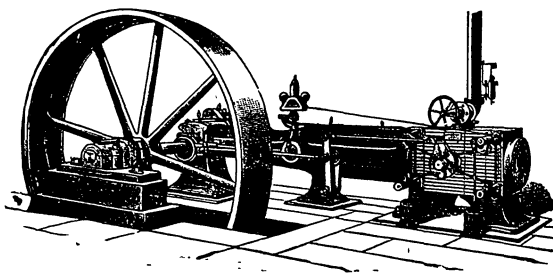
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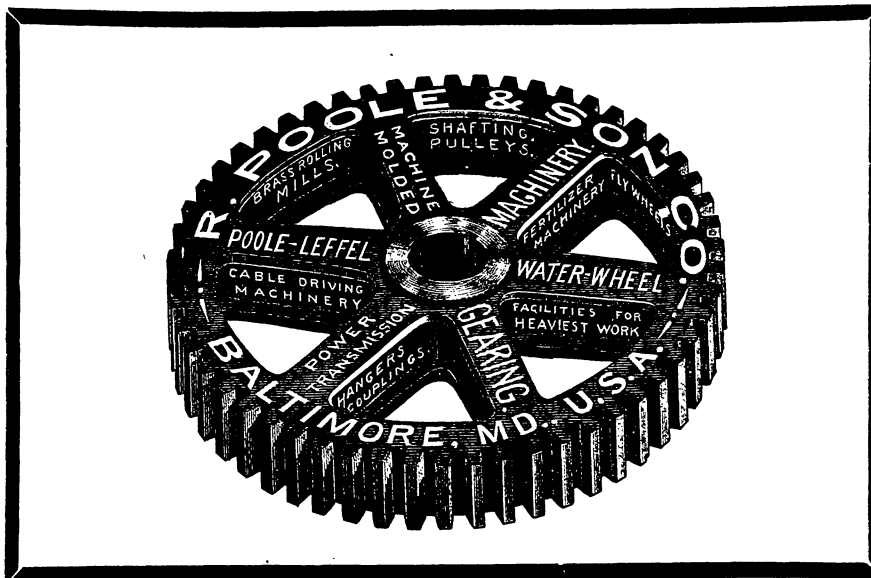
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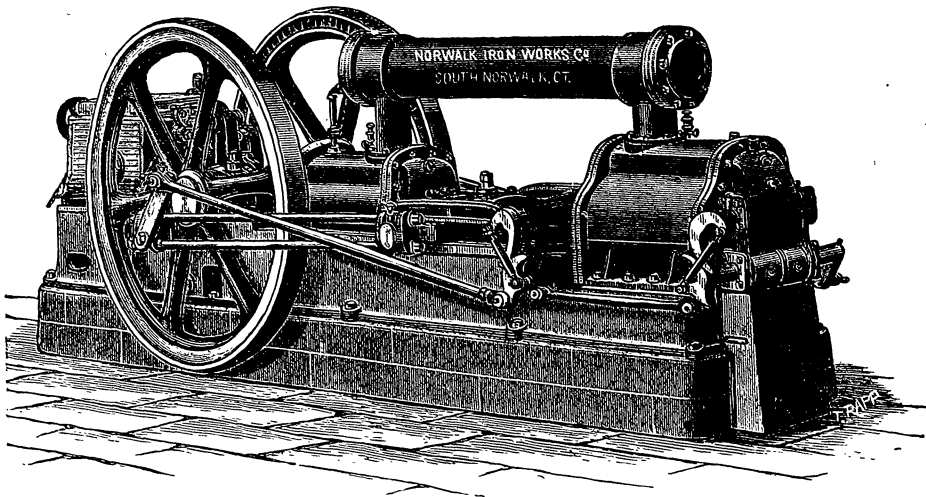
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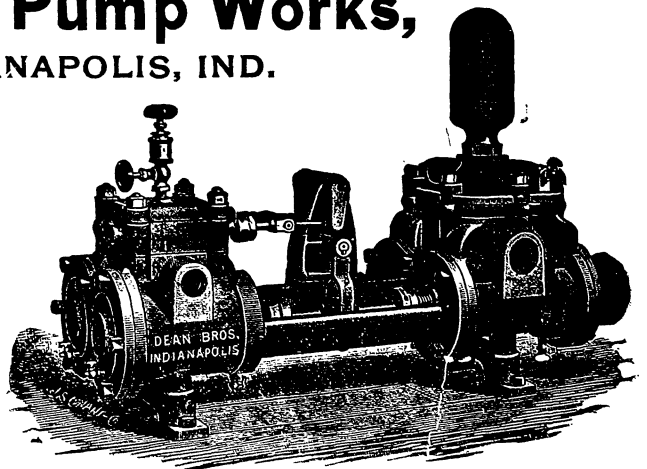
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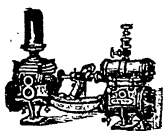


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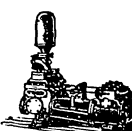
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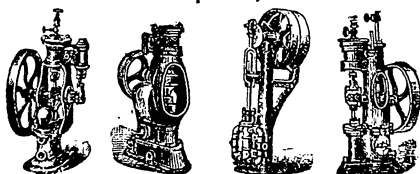
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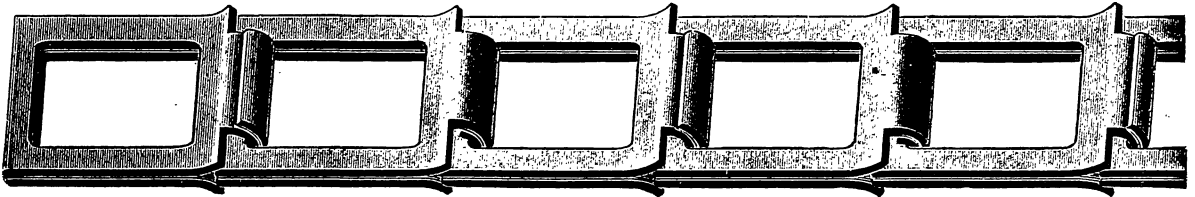
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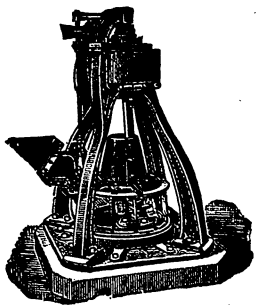
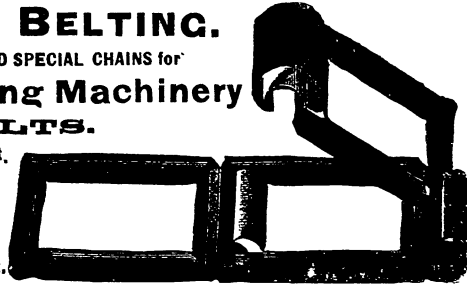
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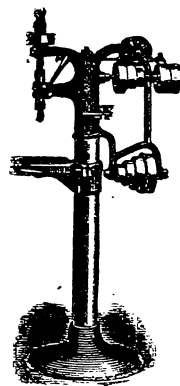


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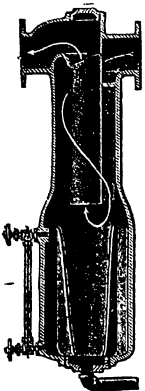
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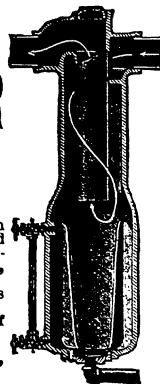
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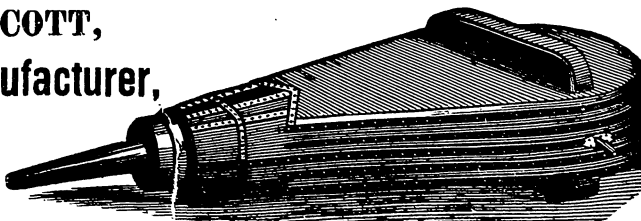


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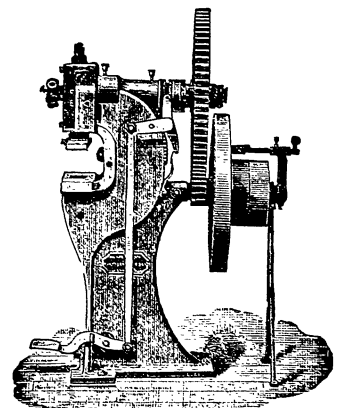
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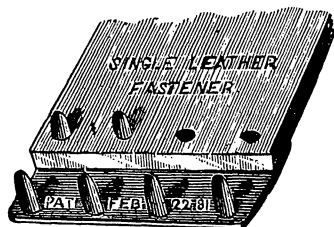
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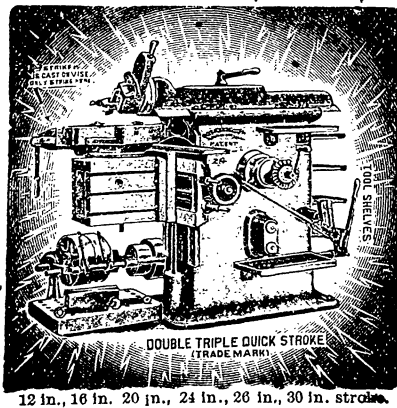
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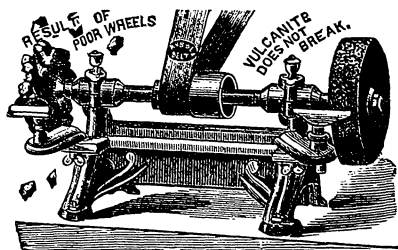
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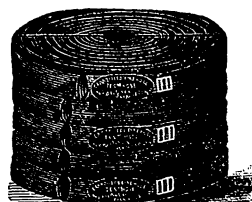
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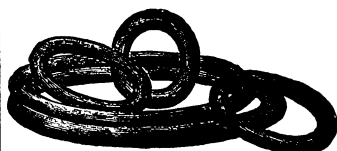
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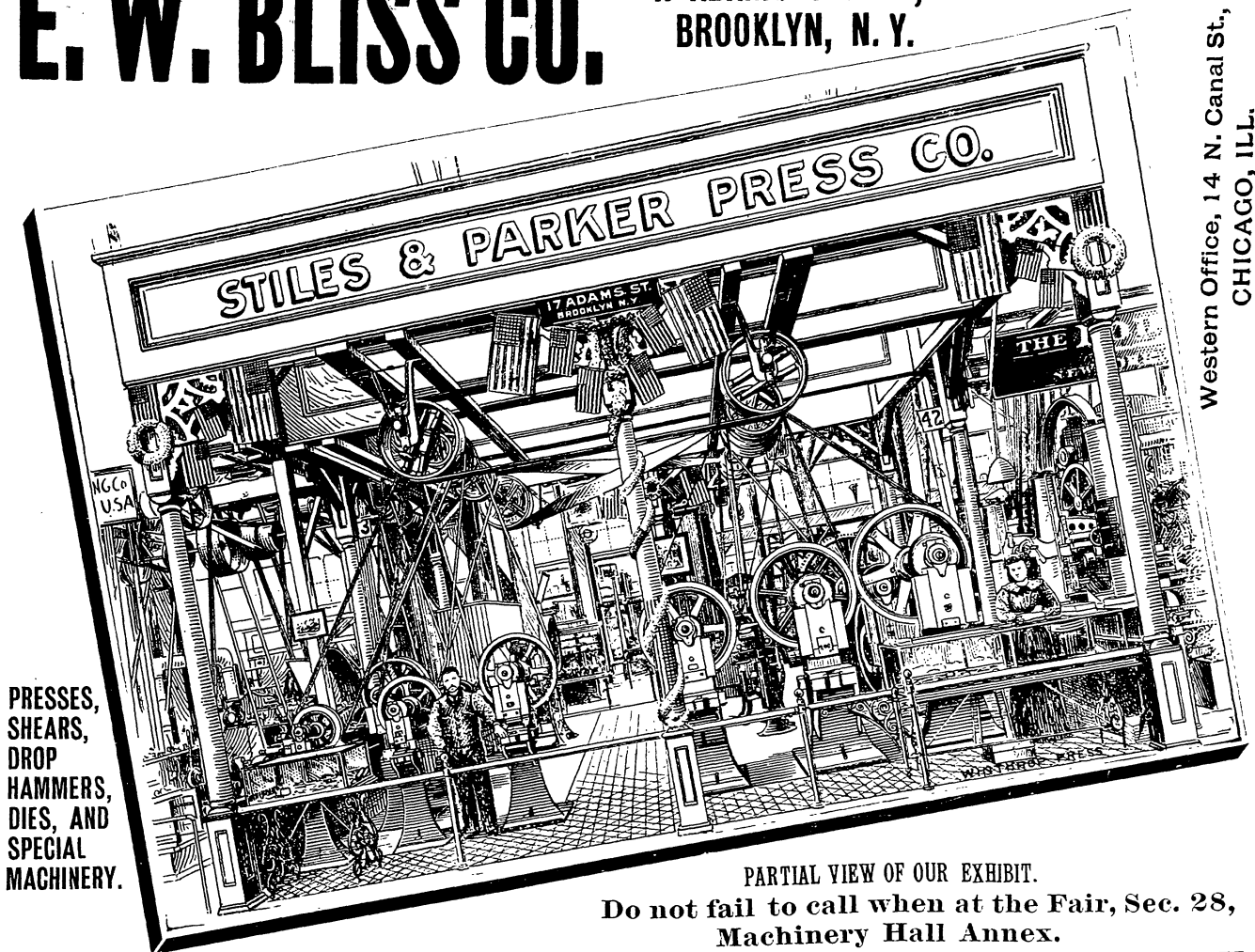
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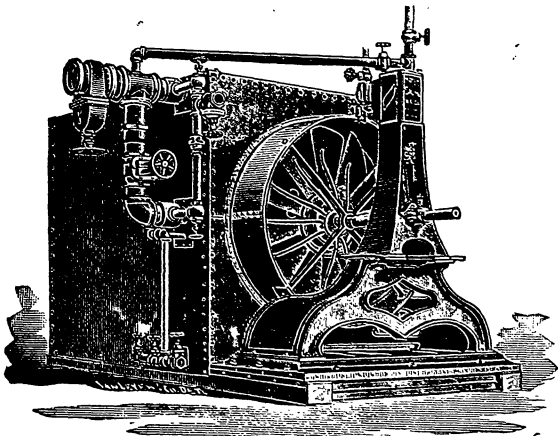
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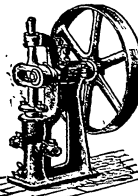
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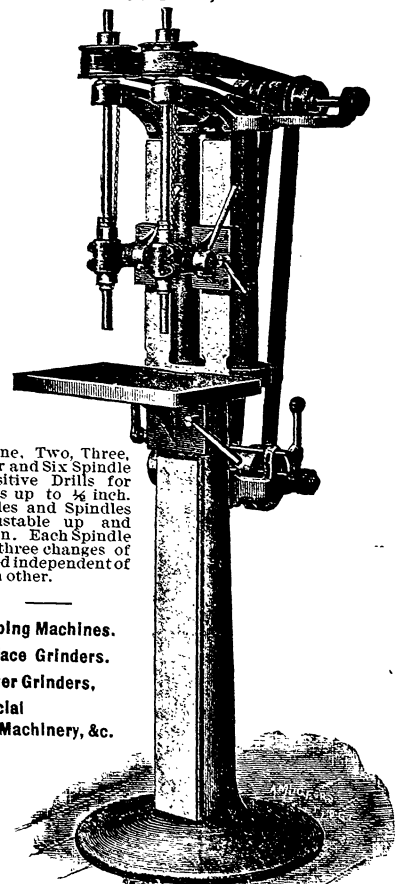


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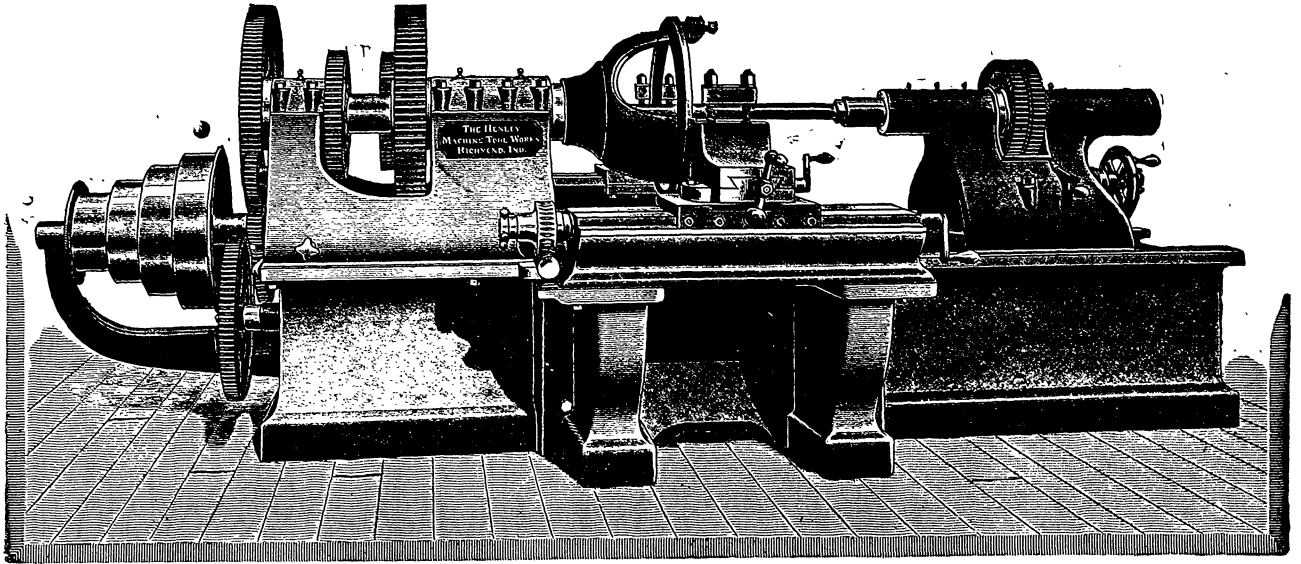
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CAT. No. 3

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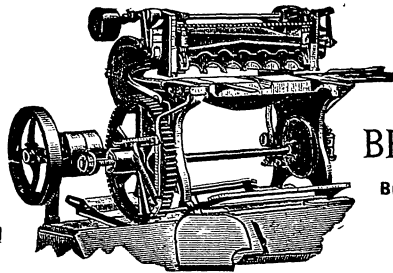
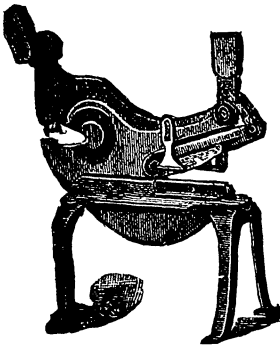
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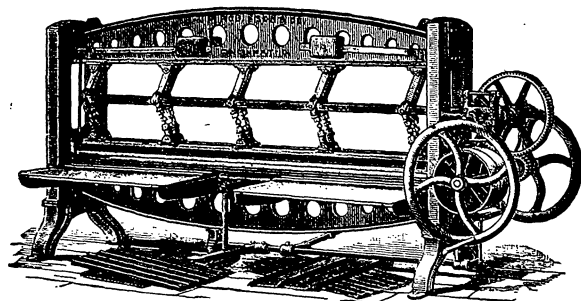
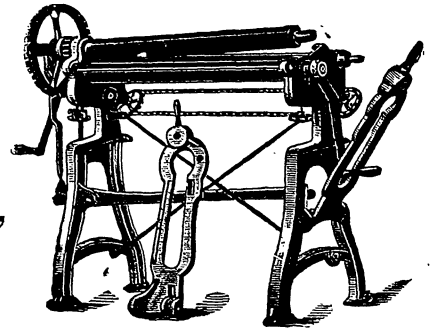
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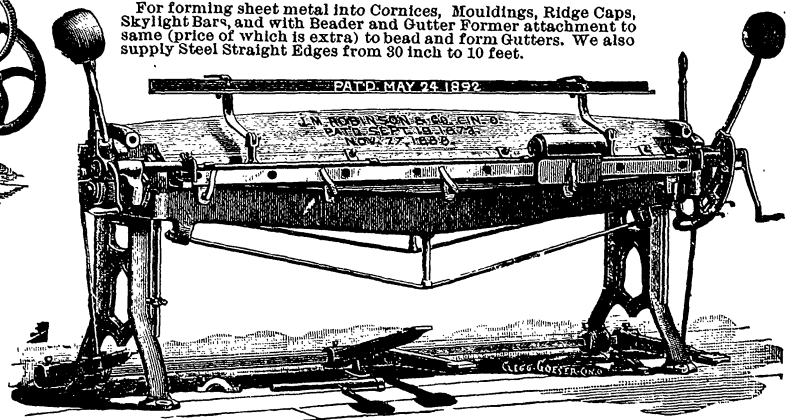
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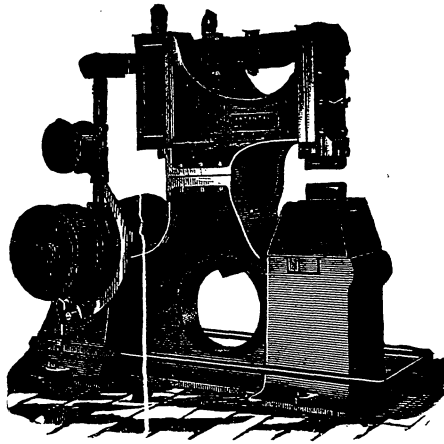


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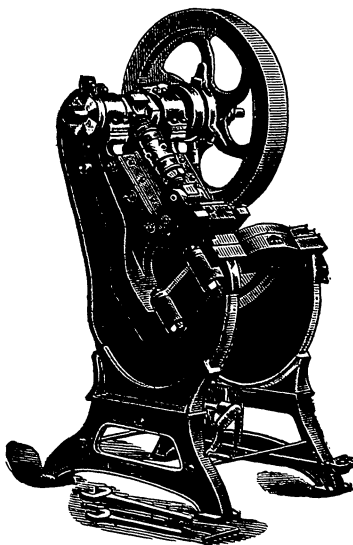
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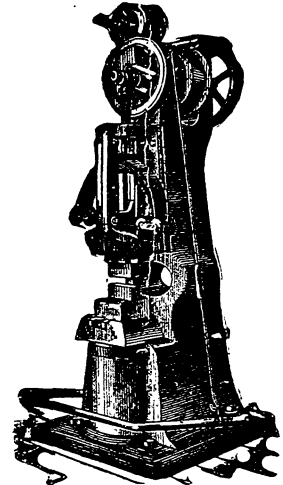


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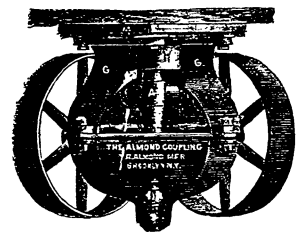
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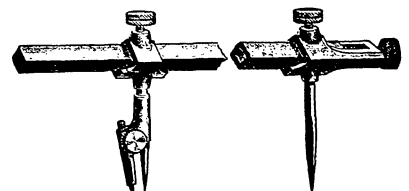
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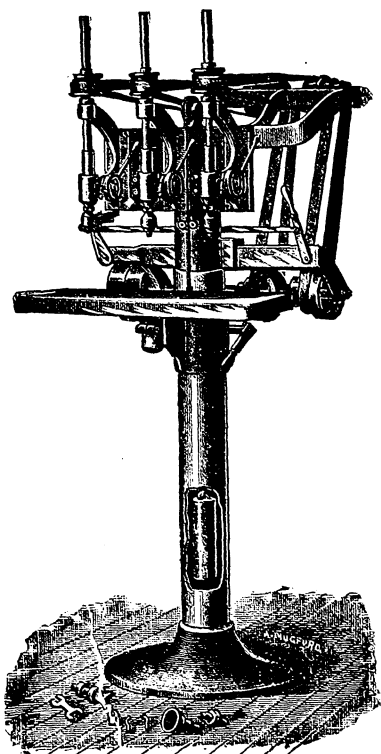


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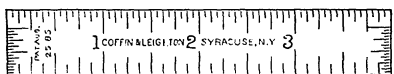


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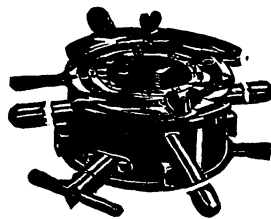
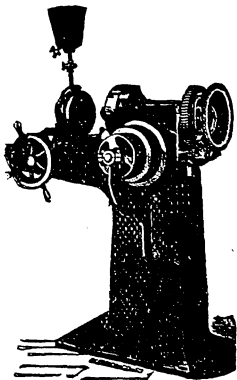
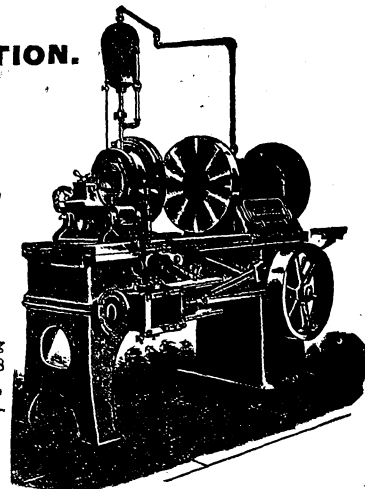
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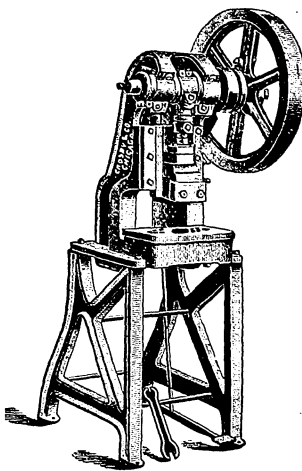


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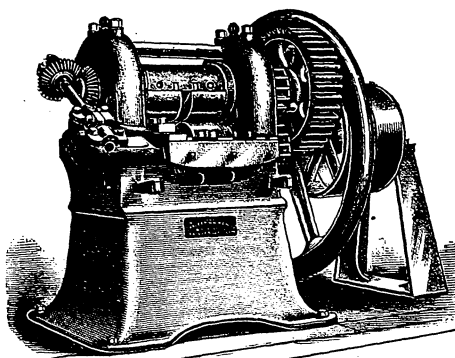
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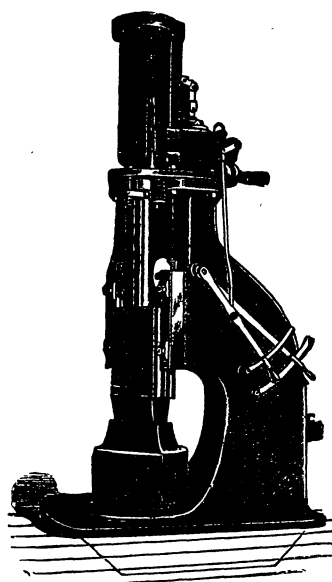
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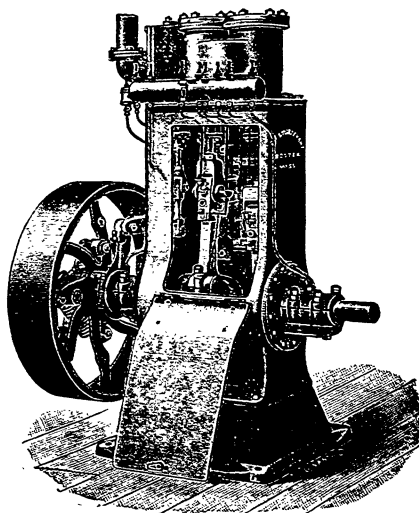
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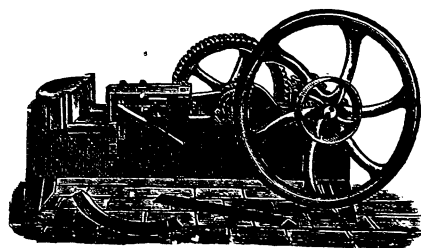
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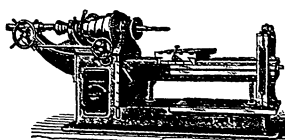
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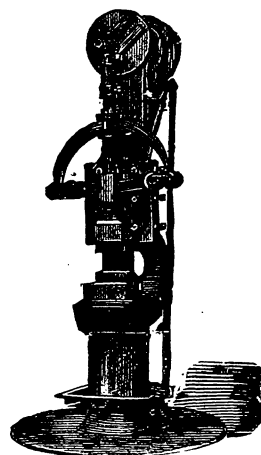
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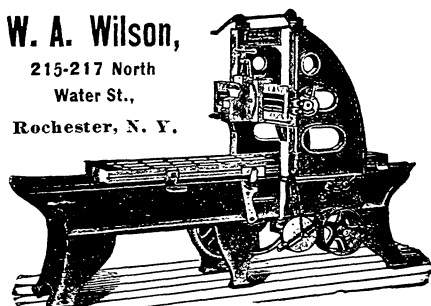
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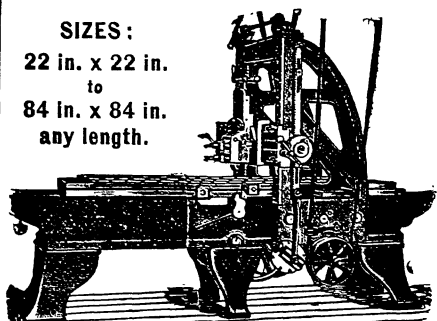
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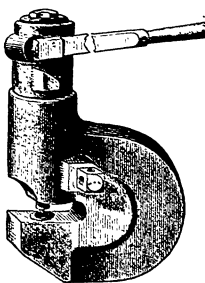
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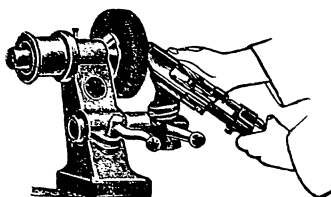
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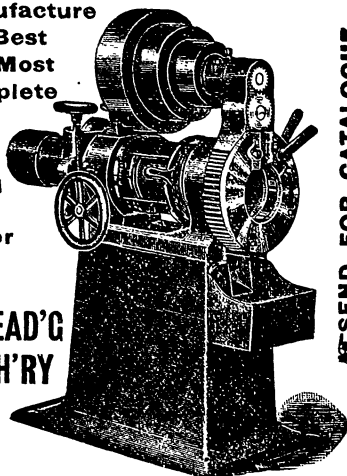
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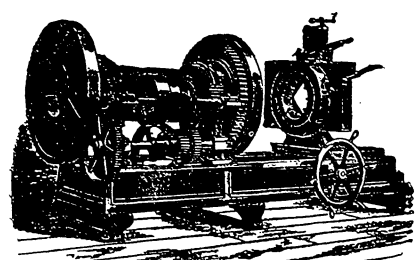
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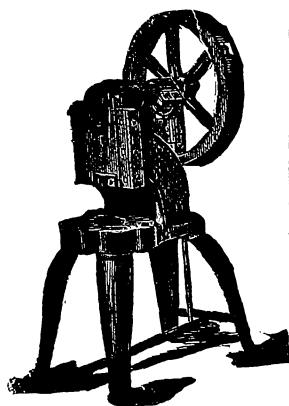


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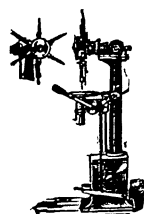
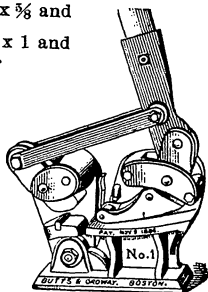
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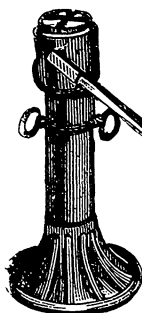
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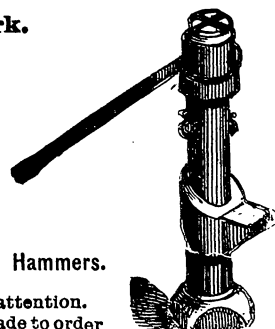
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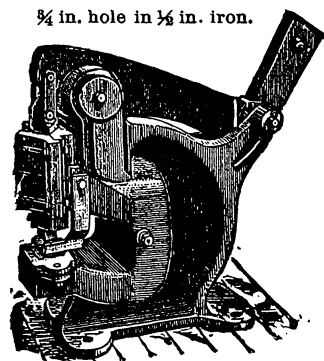
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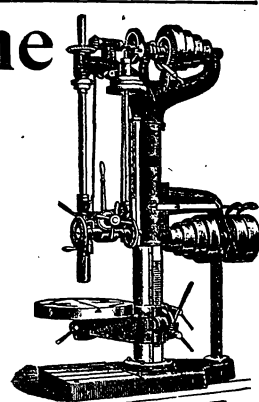
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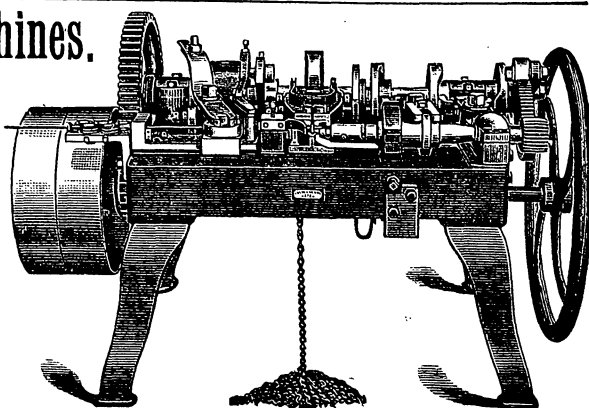
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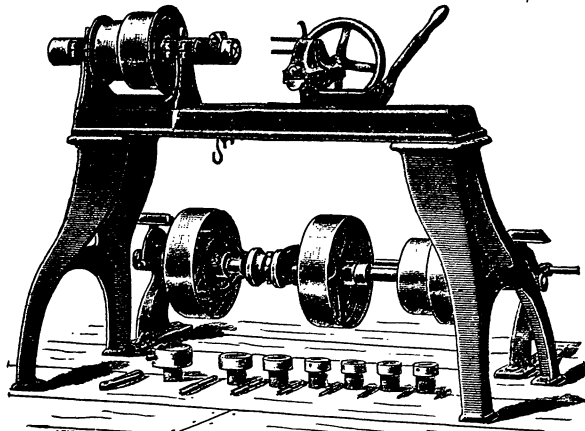
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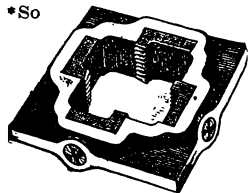
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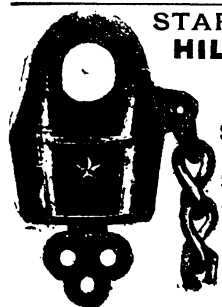
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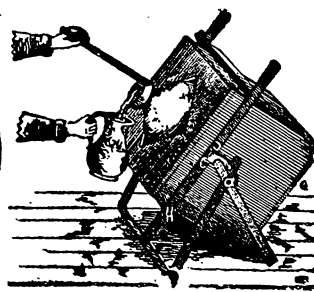
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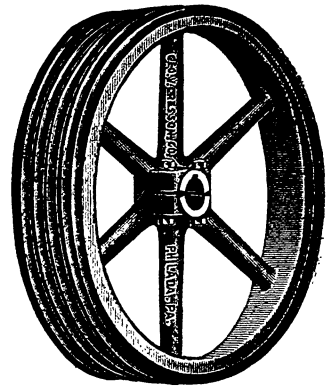
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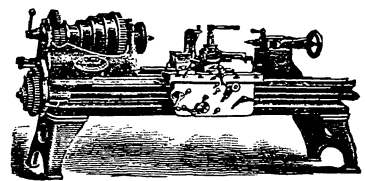
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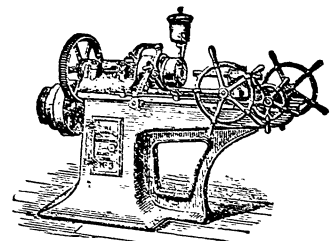
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Planers, Shapers, Drills, Slotters, Etc.

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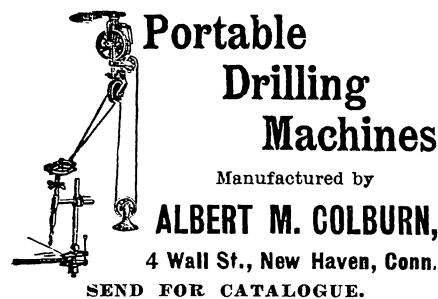
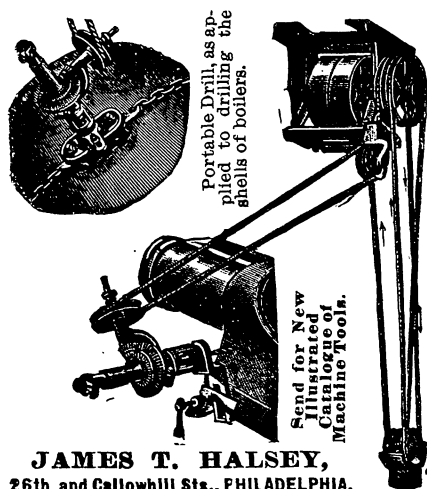
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Sheaves for Rope Driving.
Gear Wheels.

FRICITION PULLEYS.

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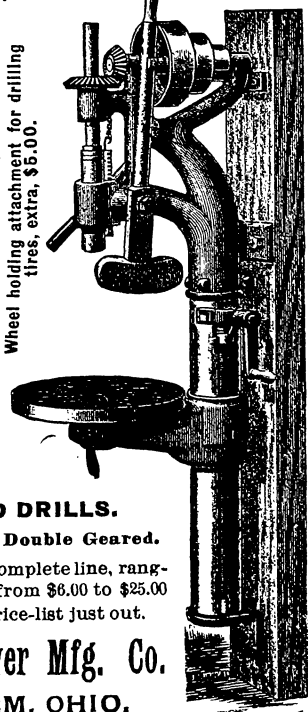


Silver's Power Post Drill.

FIG. 727.

Has CUT GRABER and is a thoroughly first-class tool in all respects. Dia. Column 4 1/2 in.; Dia. Spindle 1 3/8 in.; and bored No. 2 Morse Taper; Vertical Travel, 8 in.; Drills to centre 19 in. circle.

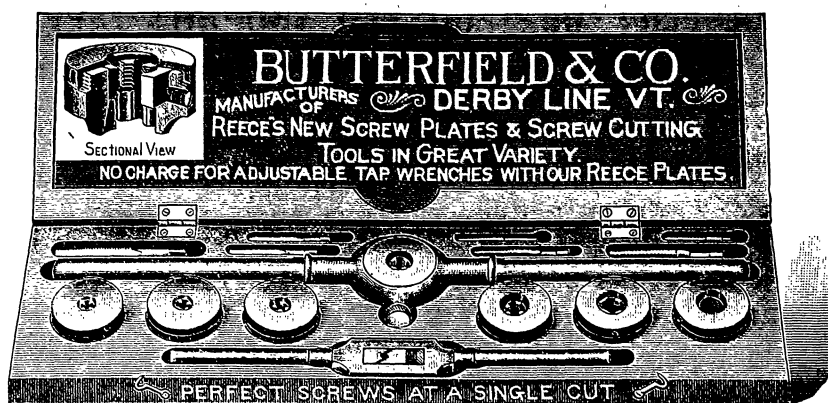
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Wheel holding attachment for drilling tires, extra, \$5.00.



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Large and complete line, ranging in price from \$6.00 to \$25.00 list. New price-list just out.

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We manufacture and keep in stock a full line of chucks for all purposes

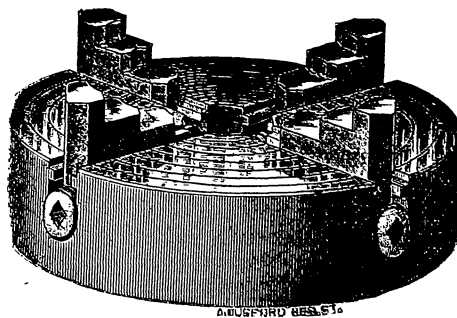
Independent 4 Jaw Chucks from 4 to 26 Inch.
Patent 4 Jaw Lathe Chucks from 4 to 26 Inch.
Reversible Face-Plate Jaws for Use on Lathes from 30 to 72 Inch.
Two-Jaw Chucks, Round and Box Body, from 4 1/2 to 18 Inch.
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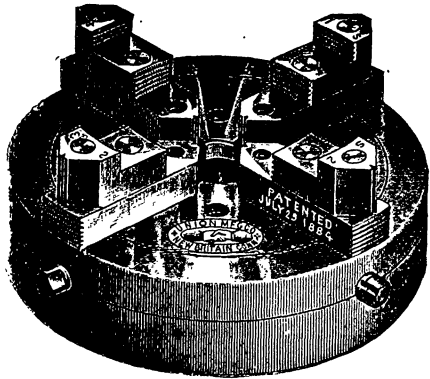
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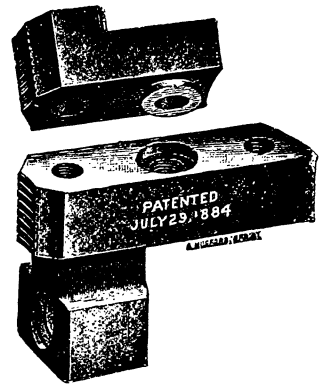
Combination with Reversible Jaws.

ALSO

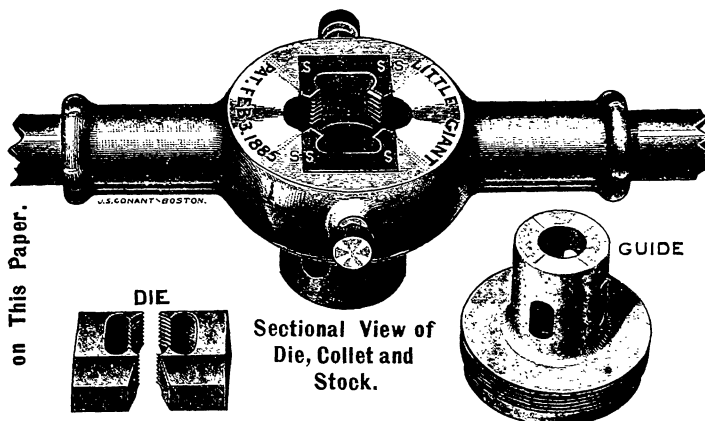
Showing Sectional Cut of Jaw.

We guarantee our Chucks in every particular.

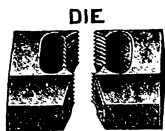
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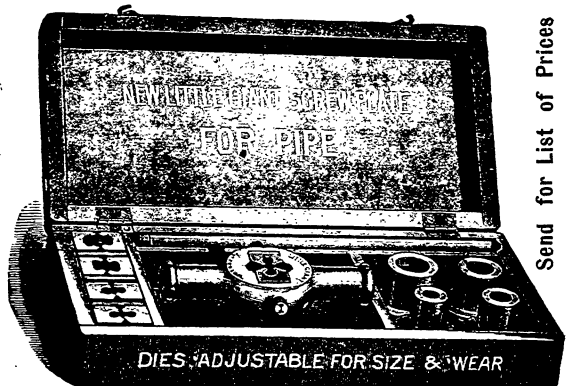
on This Paper.



Sectional View of Die, Collet and Stock.

GUIDE

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To change from one size to another, simply screw out the guide, drop out the die, and replace with size die and guide required.

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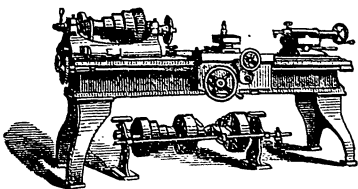
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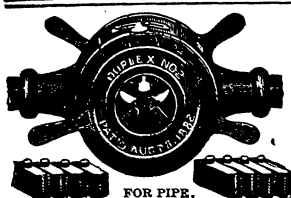
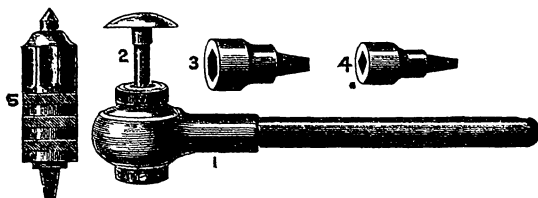
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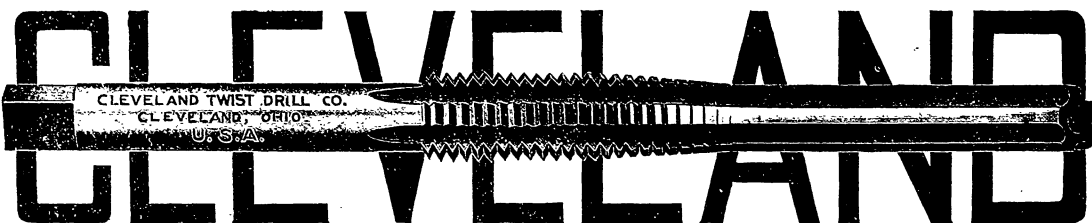
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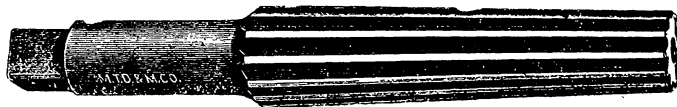
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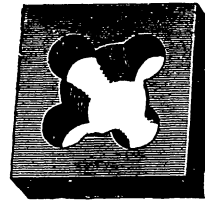
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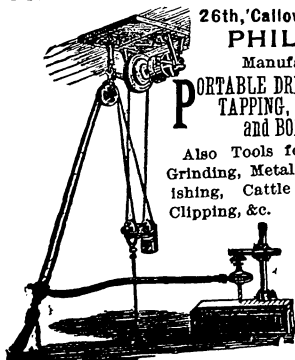
Manufacturers of

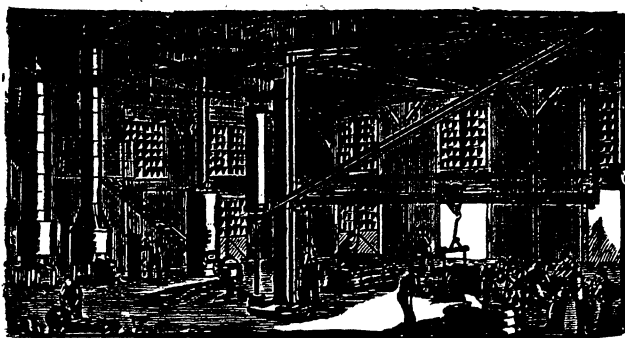
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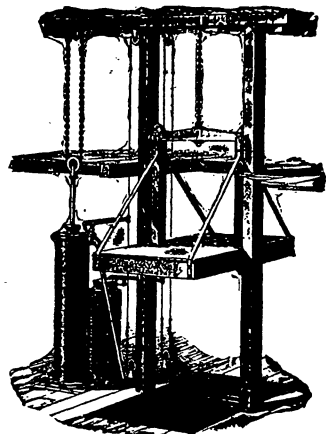
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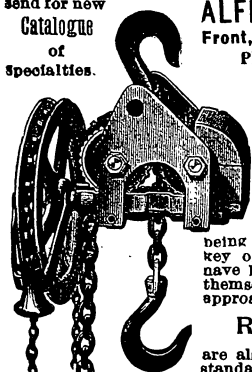
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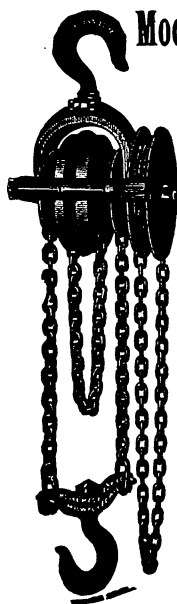
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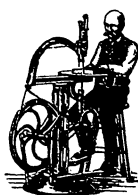
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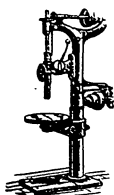
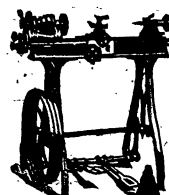
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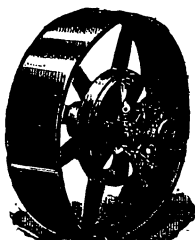
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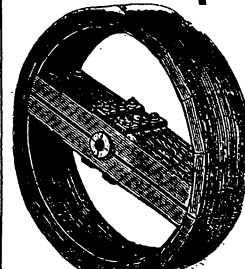
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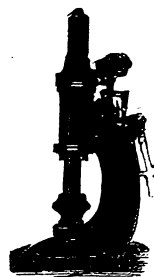


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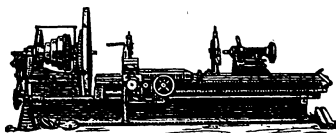
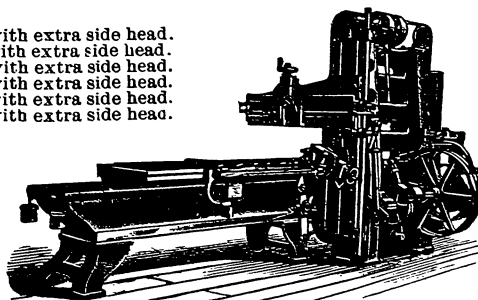
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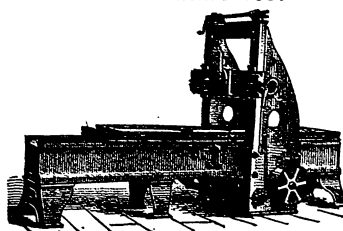
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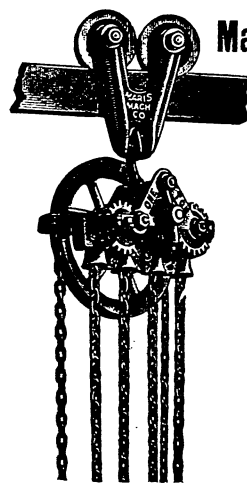
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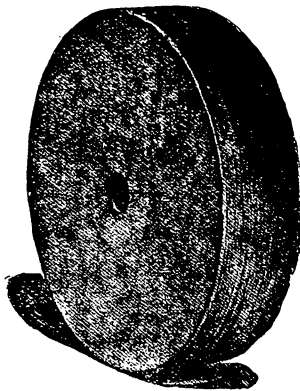
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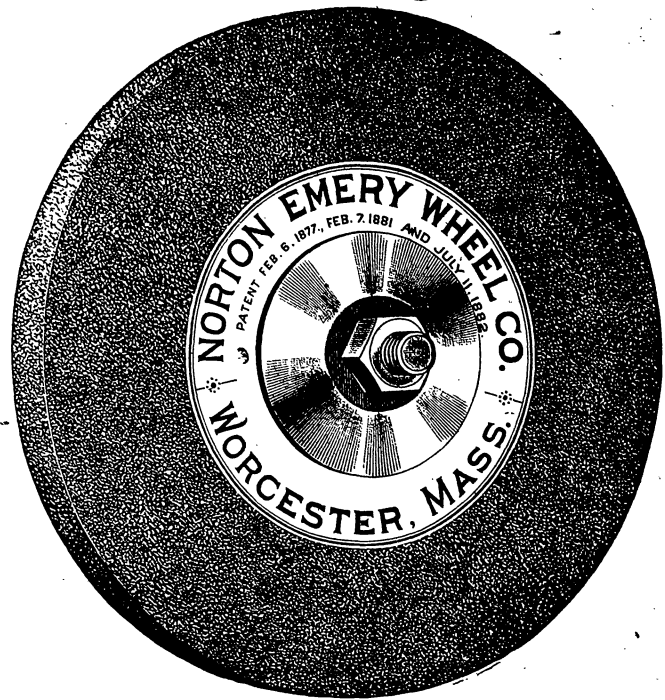
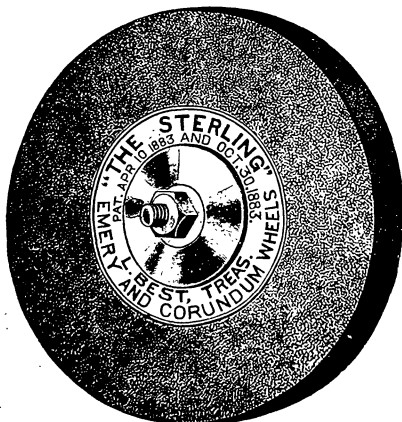
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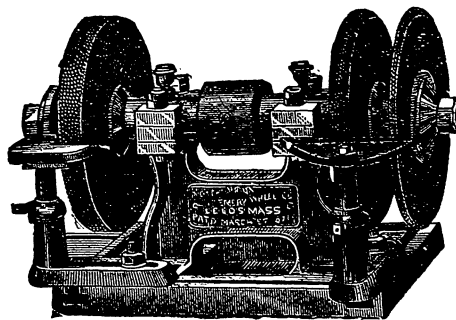
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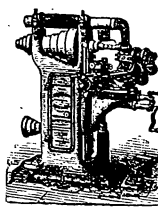
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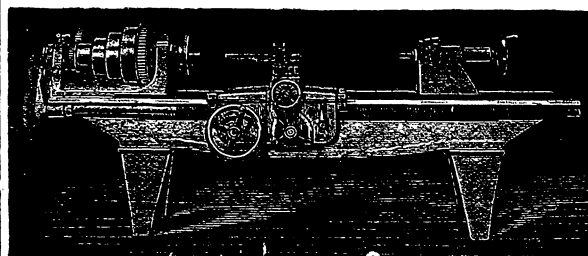
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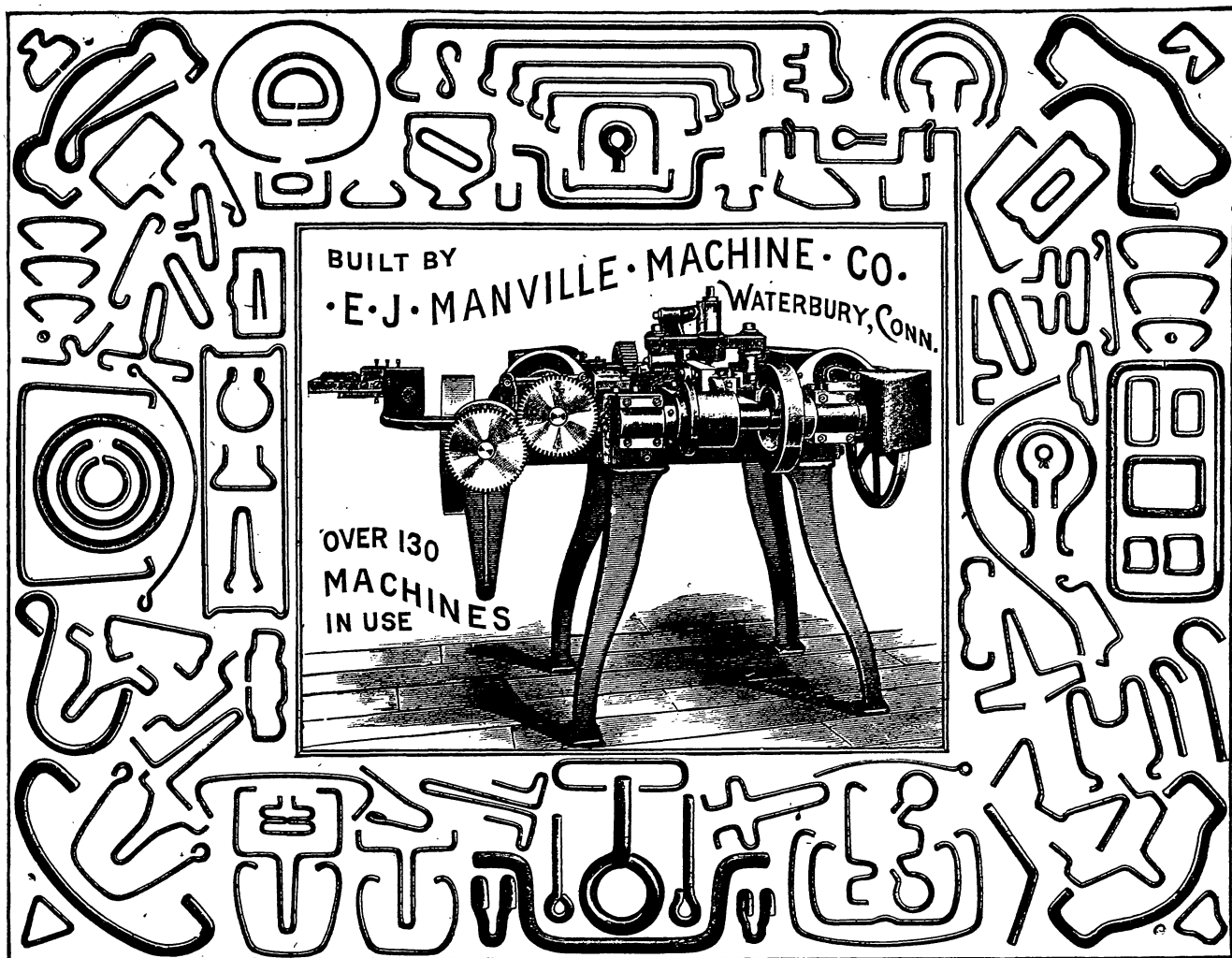
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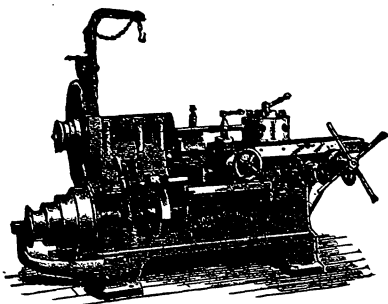
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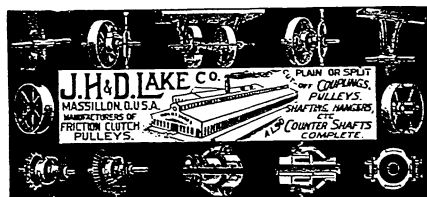


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of the corporation known heretofore as The Albany Stove Company. Whereas, by order of the Supreme Court of the State of New York, granted in the City of Albany, N. Y., on the 10th day of October, 1893, the undersigned, receiver of the assets and effects of the corporation known heretofore as The Albany Stove Company, was directed to offer for sale the following described property, viz.: The real estate and buildings owned by the said corporation "The Albany Stove Company," situated on Tivoli street, in the City of Albany, N. Y., being the same premises used by the said corporation in carrying on its business of manufacturing stoves and iron castings, and is the same real estate conveyed by Eugene Van Rensselaer and others, as executors, etc., to The Capital Co-operative Foundry Company, by deed dated October 15, 1889, recorded in Albany County Clerk's office, December 15, 1889, in Book No. 228 of Deeds, on page 241, and by Van Rensselaer Land Company to Albany Stove Company by deed dated January 10, 1890, recorded January 14, 1890, in Book No. 412 of Deeds, on page 318, together with the machinery, tools and implements used in carrying on the business above referred to.

Now, therefore, in pursuance of said order, the undersigned offers for sale to the highest bidder the property above described.

All bids to be sealed, and must be distinctly marked on the envelope in which they are enclosed, "Bids for property of the Albany Stove Company," and addressed and delivered to the undersigned at No. 82 State street, Albany, New York, on or before the 17th day of November, 1893. The right to reject any and all bids is hereby reserved, and sale can only be completed upon order of the court.

Bids will be opened by the receiver at the office of Francis H. Woods, No. 116 State street, Albany, New York, on Saturday, November 18, 1893, at 10 A. M. Terms, purchase price to be paid within twenty days after notification of acceptance of bid.

Dated October 11, 1893.

JOHN GUTMANN,

Receiver of The Albany Stove Company.

SALE OF VALUABLE PROPERTY

of the corporation known heretofore as The Albany Stove Company. Whereas, by order of the Supreme Court, granted in the city of Albany, N. Y., on the 10th day of October, 1893, the undersigned, receiver of the assets and effects of the corporation known heretofore as The Albany Stove Company, was directed to offer for sale the following described property, viz.: The patterns, shop rights and flasks owned by the said corporation, and being the patterns, shop rights and flasks for the "Home Yale" parlor and range, "Yale" cook, "White Oak," "Art Yale Range," "Rose" range, "Oneida," and for other castings, formerly manufactured by the said corporation, a more particular description of which will be given on application to the undersigned.

Now, therefore, in pursuance of said order, the undersigned offers for sale to the highest bidder the property above described.

All bids to be sealed and must be distinctly marked on the envelope in which they are enclosed, "Bids for property of The Albany Stove Company," and addressed and delivered to the undersigned, at No. 82 State street, Albany, N. Y., on or before the 17th day of November, 1893.

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Terms: Purchase price to be paid within twenty days after notification of acceptance of bid.

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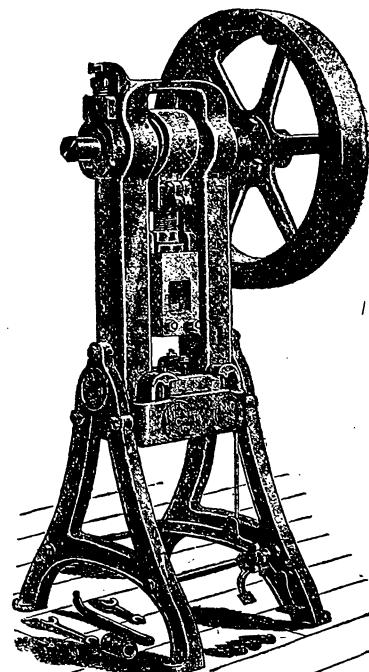
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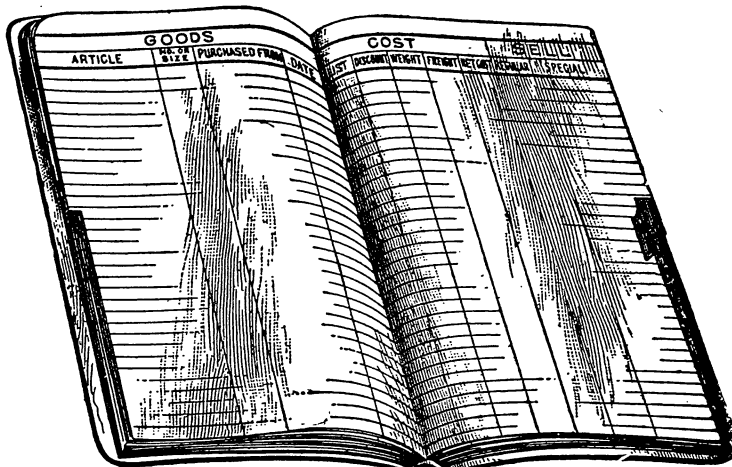
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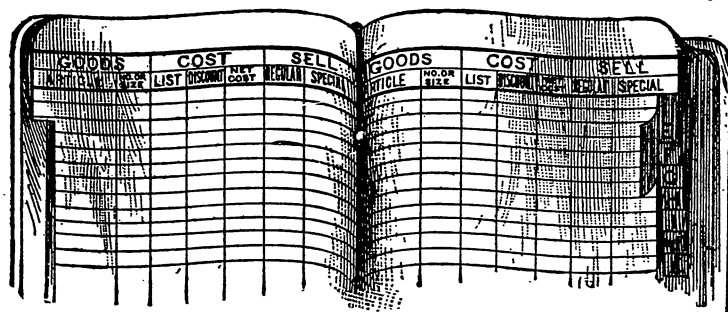
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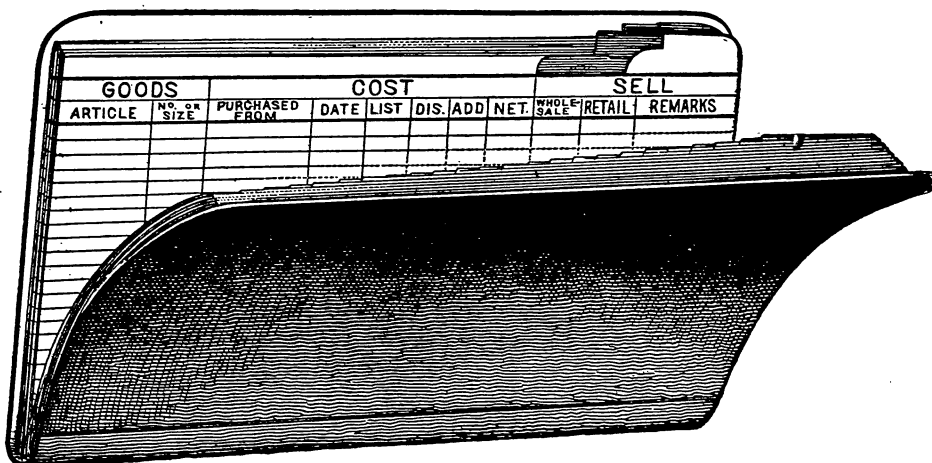
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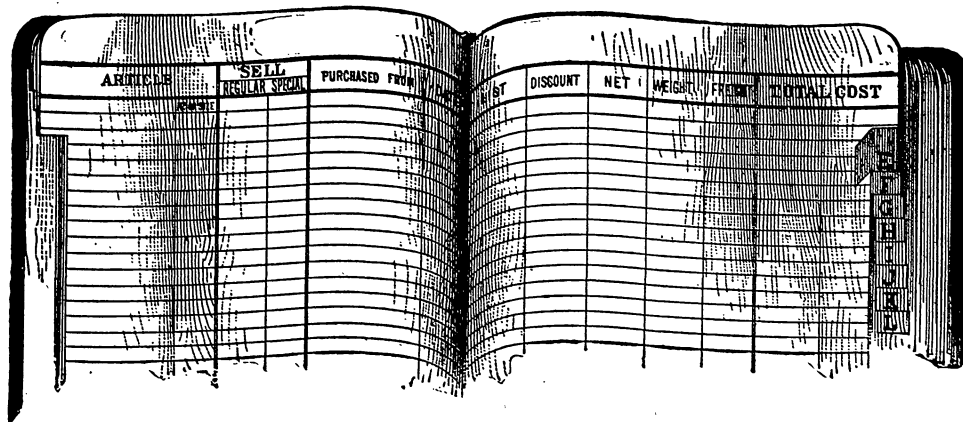
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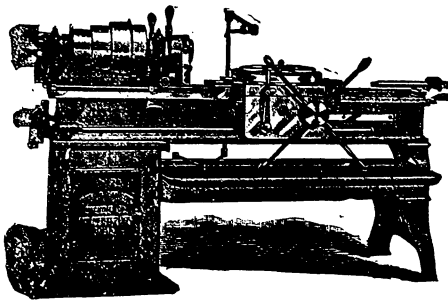
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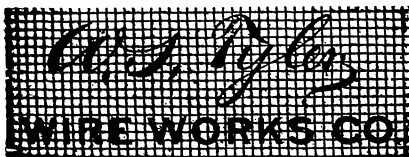
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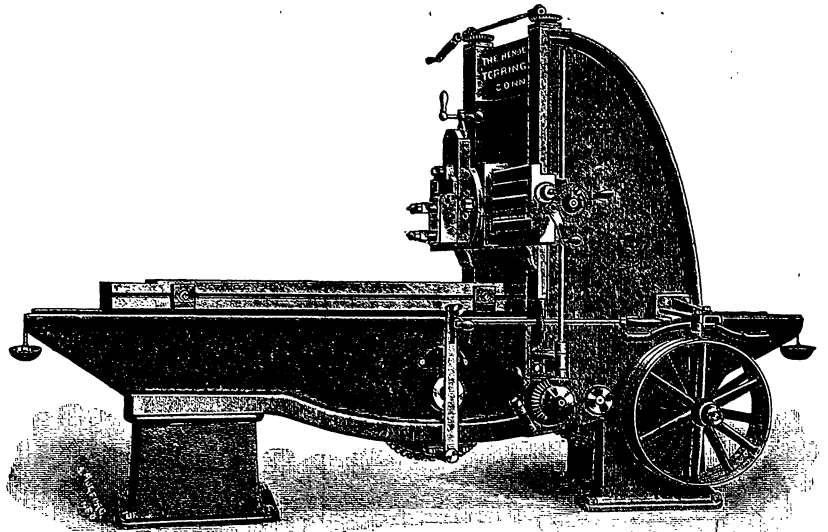
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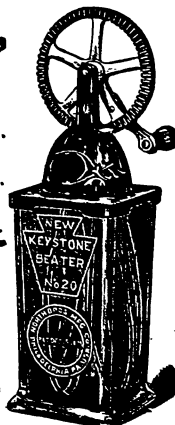
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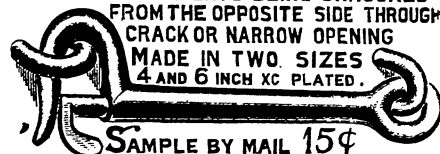


30 POUND SYLPH.
Strongest Cycle of its weight
on the market.

Guaranteed highest grade, and built for scorchers and hard road riders. By using tubular hubs, front fork, saddle post, etc., we do away with forgings and use heavier tubing. Our system of lap-brazing makes joints as strong as any part of the tubing, and thus we get a lighter and by far stronger machine. Investigate. Catalogue free. **ROUSE & DUBUE**
CYCLE CO., 146 G St., Peoria, Ill.

COVERT'S SELF-LOCKING, GATE AND DOOR HOOK.

POSITIVELY PREVENTS BEING UNHOOKED
FROM THE OPPOSITE SIDE THROUGH
CRACK OR NARROW OPENING
MADE IN TWO SIZES
4 AND 6 INCH XC PLATED.



SAMPLE BY MAIL 15¢

Call for Our Banner Bolt Snap.

This snap has many important advantages over other makes of Bolt Snaps, viz.: It is lighter, the spring is entirely covered and protected from foreign substance and freezing, and is lower in price.

Made in all sizes; Round, Loop and Open Eye. We are headquarters and the most extensive manufacturers in Saddlery, Coach and General Hardware Specialties.

Covert's Saddlery Works,

FARMER, N. Y., U. S. A.

Electric Toy Making, Dynamo Building and Electric-Motor Construction. By T. O'CONOR SLOANER, A.M., E.M., Ph.D. This work treats of the making at home of electrical toys, electrical apparatus, motors, dynamos, and instruments in general and is designed to bring within the reach of young and old the manufacture of genuine and useful electrical appliances. The work is specially designed for amateurs and young folks. Very fully illustrated. \$1.00

For sale by David Williams, 96-102 Reade St., N. Y.

Hardware Dealers Can Profitably SELL BICYCLES.

There is a large trade in Bicycles in all parts of the country and much of that trade naturally belongs to dealers in hardware. Good bicycles meet with a ready sale and pay a fair percentage of profit.

COLUMBIAS

Are the representative high grade machines in America. A Columbia is the easiest machine to sell to the best trade because it is unquestionably the standard wheel of the world.

We want enterprising agents of good standing and solicit correspondence.

Pope Mfg. Co.,
221 Columbus Ave.,
Boston, Mass.

Ask Your Jobber for

Stanley's Steel Butts & Hinges,
AND INSIST ON HAVING THEM.

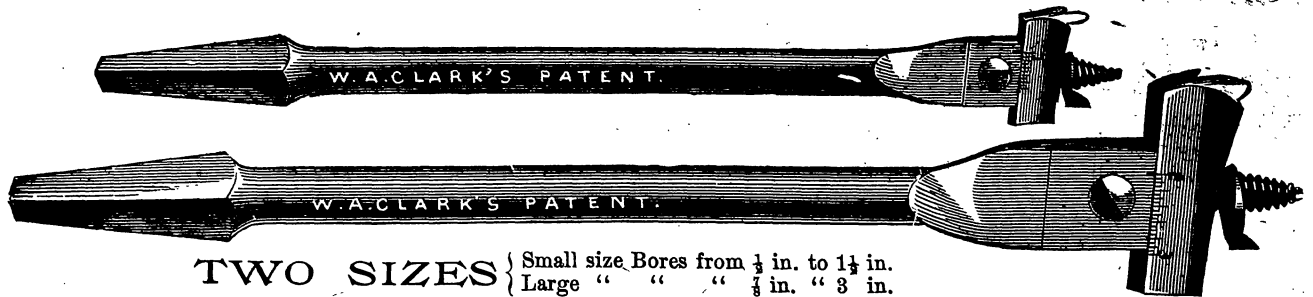
Catalogue Free on Application.

The Stanley Works.

NEW BRITAIN, CONN.

79 CHAMBERS STREET, NEW YORK.

THE WM. A. CLARK PATENT EXPANSIVE BIT.



TWO SIZES } Small size Bores from $\frac{1}{4}$ in. to $1\frac{1}{4}$ in.
 Large " " " $\frac{3}{4}$ in. " 3 in.

SPECIAL CUTTERS: No. 5—For Large Bit, Bores from 3 in. to 4 in. No. 6—For Large Bit, Bores from 4 in. to 5 in.

Stock and workmanship superior to all others. Every part interchangeable.

Quality guaranteed. For sale by all Hardware Dealers.

Manufactured by **R. H. BROWN & CO.,** New Haven Conn.

You take no risk on the quality.
 We make only the best!



**Sand
 Papers**
 IN
 Reams and Roll

Flint Paper
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 Emery Paper
 Emery Cloth

HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

BAEDER, ADAMSON & CO.

730 MARKET STREET, PHILADELPHIA.
 97 BECKMAN STREET, NEW YORK.
 143 MILK STREET, BOSTON.
 182 LAKE STREET, CHICAGO.

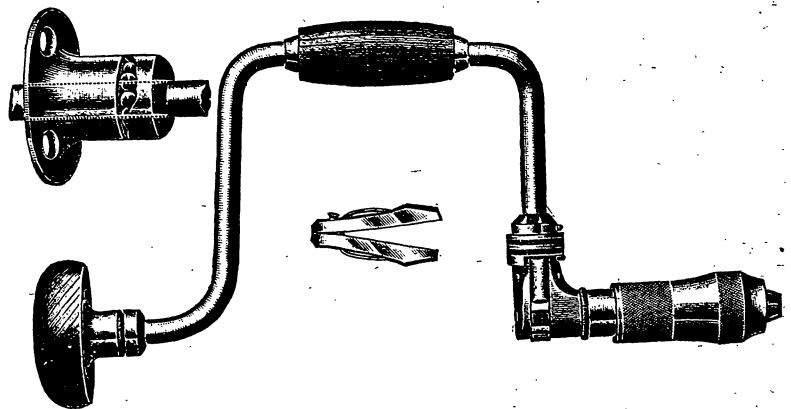
Palmer's Common Sense Frame Pulley.



MANUFACTURED BY

PALMER HARDWARE MFG. CO., Troy, N. Y.

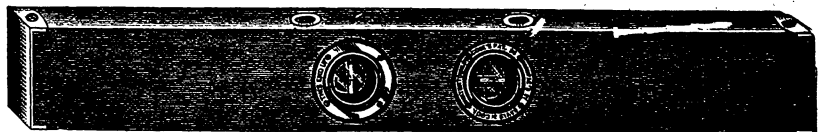
BARBER IMPROVED BRACE.



Instead of reducing the price of our braces to meet competition, we have from time to time increased the cost of making the goods. Our latest improvement is the use of Ball Bearings, as seen in the cut. These balls prevent all wear, and cause the head to turn without friction. It is probably the best improvement which has been put on braces for many years. This has been the leading brace in market for a long time and we intend to make it worthy of its reputation for a long time to come. All Hardware Dealers will furnish them.

MILLERS FALLS CO.,

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**COOK'S
 PATENT
 LEVEL.**

Made in Wood and Iron. Every Level Fully Guaranteed.

Inquire at your nearest hardware store for them. If not in stock, send to

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 OTHER.

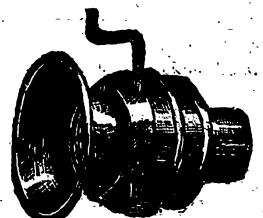
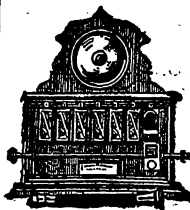
DAVIS & COOK,
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W. R. OSTRANDER & CO.,

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 Manufacturers of

**SPEAKING TUBES, WHISTLES, ORAL, ELECTRIC
 MECHANICAL AND PNEUMATIC ANNUNCIATORS
 AND BELLS.**

Complete outfits of Speaking Tubes, Whistles, Electric, Mechanical and Pneumatic Bells. A full line always in stock. Send for new catalogue. Factory, DeKalb ave. near Knickerbocker Brooklyn, N. Y.



CABINET LOCKS

OF EVERY KIND.

DRAWER LOCKS,
CUPBOARD LOCKS,
WARDROBE LOCKS,
CHEST LOCKS
DESK LOCKS.

A complete line of more than 1000 list numbers exclusive of our old
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YALE CABINET LOCKS.

THE YALE & TOWNE M'F'G CO.,

STAMFORD, CONNECTICUT.

New York. Chicago. Philadelphia. Boston. Pittsburg. San Francisco.

THE DEALER who sells what
THE PEOPLE ask for.

MAKES FRIENDS and MONEY, and
SAVES TIME and TROUBLE.

The people ask for

**LePage's
Liquid
Glue,** And the people are right.

It is the strongest and best glue made. It has been
imitated, but never equalled. Be sure to get what you
order and ACCEPT NO SUBSTITUTES.

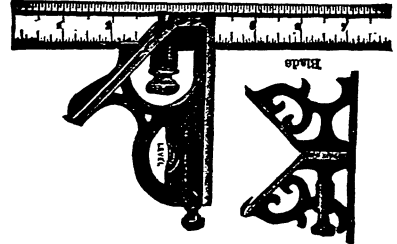
Our name is on every label

RUSSIA CEMENT CO.,

GLoucester, MASS.

New York Office, 95 Reade and 113 Chambers Streets.
Pacific Coast Office, 23 Davis Street, San Francisco, Cal.

CHAPLIN TRY AND CENTRE SQUARE.



Also a full line of

MACHINISTS' FINE TOOLS.

If you haven't our 1893 catalog send us a
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STANDARD TOOL CO.,

ATHOL, MASS., U. S. A.

ATHOL MACHINE CO., Selling Agents.

**NONPAREIL
Ratchet Wrenches.**

Made of best forged Tool Steel; are
easily and readily adjusted and con-
trolled. Can be made reversible in-
stantly without removing from their
work by throwing over the lever in
slot of the handle.

The Set of Combination Tools No. 1
includes the wrench, two sockets, one
for screw-driver, bit or reamer shank,
with wood handle, and one socket



for drill shank and feed nut. The
jaws on this wrench open from 3-16
to 1 1/4 inches.

Send for Illustrated Circular
and Price-list of various sizes

The Keystone Mfg. Co.
312 Terrace, Buffalo, N. Y.

— REMEMBER —

WE MAKE ONLY

The Very Highest Grade

OF
MECHANICS' TOOLS.

H. H. MAYHEW CO., Shelburne Falls, Mass.



3 NICKLE, Silver and Bronze Metallo
Figures and Letters, Sizes 1/4 in to 3 in.
Pattern Letters, Steel Stamps, Brands.
Dies &c. Send for Reduced Price List.
We make a specialty of the Hardware Trade.
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W. & B. DOUGLAS, MIDDLETOWN, CONN.

Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

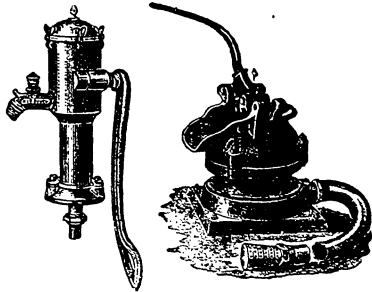
A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 209.

Fig. 381.

Fig. 145.



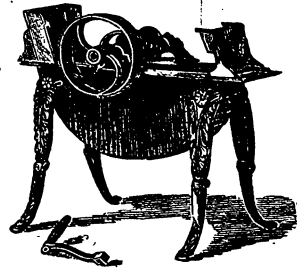
or wherever it is desired to raise a large quantity of water by
hand power.

The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

CAPACITY

from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced.
Made either as shown in cut for Hose or for IRON Pipe Suction underneath.



C. I. Grindstone Frame.

Send for Circular and Price List.

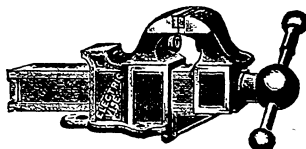
THE DEMING & CO.
FACTORY
SALEM O.U.S.A.
HAND & POWER PUMPS, WELL SUPPLIES & C. VERTICAL STEAM PUMPING ENGINES.
ARTESIAN WELL CYLINDERS, HYDRAULIC RAMS.
N.Y. OFFICE: 72 JOHN ST.
HENNION & HUBBELL
GEN'L. WESTERN AGTS:
55 & 57 N. CLINTON ST.
CHICAGO, ILL.

F.E. MYERS & BRO.

LIFT PUMPS
THE LARGEST PUMPHOUSE IN THE UNITED STATES
ASHLAND, O.
+ CATALOGUES FREE +
Ashland Pump and Hay Tool Works.

The New York Safety Dumb Waiter,
"The Manhattan Dumb Waiter,"
"The Improved Humphrey Hand Elevator,"
Made specially to be sold by Hardware Stores. Thousands in use. Catalogues on application.
THE STORM MANUFACTURING CO
NEWARK, NEW JERSEY.
Formerly of Poughkeepsie, New York.

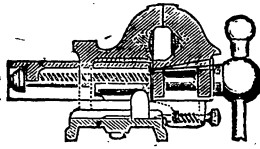
VISE.



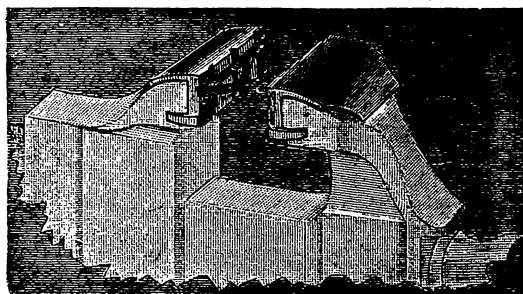
Patented Dec. 27, 1892.
IT HAS QUALITIES THAT ARE
UNDISPUTED.

Rapid, Active, Prompt

One movement in and out, one turn of the hand and the work is secured.



The Capital Machine Tool Co., AUBURN, N. Y.



BINGHAM PATENT VISE JAW CAP

Will Fit any Kind of Vise.

For protecting finished work. Will hold finished rods of any shape without injury.

3 1/2 inch.....	per pair, 40 cents.
4 " " " " " "	50 "
4 1/2 " " " " " "	60 "

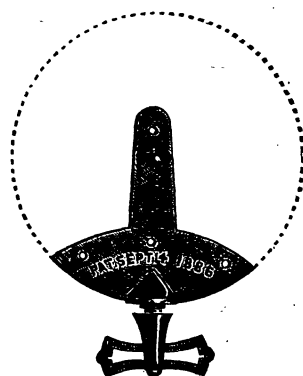
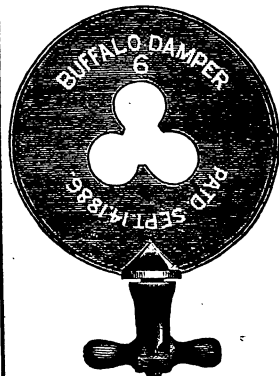
PRENTISS VISE CO.

44 Barclay St., New York.

THE BUFFALO DAMPER

SAVES

TIME AND TEMPER.
SIMPLE,
SINGLE BEARING,
EASILY PUT IN.
ONLY ONE HOLE IN PIPE.



THE BUFFALO DAMPER CLIP

Indispensable to Furnace Workers. With it a Perfect Damper of any size may be easily made. Write for prices.


All DAMPERS or DAMPER CLIPS supplied with wood or metal handles, as desired.
—SOLE MANUFACTURERS—

SIDNEY SHEPARD & CO.,
C. SIDNEY SHEPARD & CO.,

Buffalo, N. Y.
Chicago, Ill.

Proprietors of the BUFFALO STAMPING WORKS.

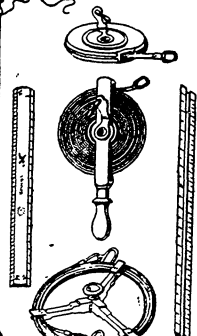
SAMPLE ORDERS SOLICITED.



KEUFFEL & ESSER CO.

NEW YORK.
BRANCH: CHICAGO.
FACTORIES: HOBOKEN, N.J.

MANUFACTURERS OF EXCELSIOR MEASURING TAPES.
SUPERIOR QUALITY, LATEST IMPROVED. GREATEST VARIETY.
STEEL · METALLIC · LINEN · POCKET TAPES.
EXCELSIOR BAND CHAINS FOR SURVEYORS, LAND CHAINS, &c.
K & E CO FOLDING POCKET RULES.
NO WARPING, NO SHRINKING, NO ILLEGIBLE JOINTS, NO BULK.
2 3.4.5.6.8 FOOT, ALSO WITH PATENT SPRINGS.
FLAT & TRIANGULAR BOXWOOD SCALES, BEST MADE.
PLUMB BOBS, THUMB TACKS, DRAWING INSTRUMENTS.
PRICE LISTS & QUOTATIONS PROMPTLY SENT.



HIGHEST GRADE PLATED WARE MADE.

THE MAJESTIC.

Design Patented August 29th, 1893.

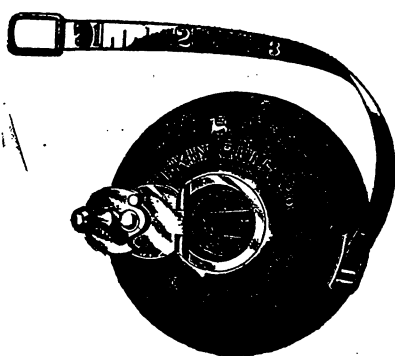


All our goods Sectional Plated on parts most exposed to wear.

Branch Offices:

19 Murray St.,
New York.
110 & 112 Wabash
Ave., Chicago.
722 Chestnut St.,
Philadelphia.
133 Charles St.,
Baltimore.
120 Sutter St.,
San Francisco.

The Rogers and Hamilton Co., Factories and Main Office, WATERBURY, CONN.
FOR SALE BY ALL THE LEADING JOBBERS.



"RELIABLE" Steel Measuring Tapes.

Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval. We carry a complete stock of our goods at our New York Office, 20 Murray St.

LUFKIN RULE CO., Saginaw, Mich.

IRON INSTEAD OF WOOD.

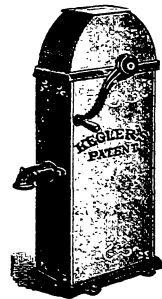
GALVANIZED IRON
TUBING and CURB,

FOR
CHAIN PUMPS,
(Kegler's Patent)

Are Giving Universal Satisfaction,

BECAUSE:

They do not rust and accumulate filth—always clean. Extreme lightness is combined with strength and durability. No freezing. No waste of water by reason of enlarged reservoir at top of tubing. No annoying wheel at bottom. Easy to handle. Tubing weighs less than 1/4 lb. per ft. is connected by couplings and can be attached to any make of curb.



Send for Catalogue.

Bellevue Pump Co., Bellevue, Iowa

COLUMBIA STEELWIND MILL

New in Principle.
Beautiful in Appearance.
Powerful in Operation.
Contains covered Internal Gear. Unequaled in the line of Pumping Wind Mills. We solicit the closest investigation. Also Columbia Steel Derricks, Iron Turbine Wind Engines, Buckeye Force & Lift Pumps, Tank and Spray Pumps, Buckeye and Globe Lawn Mowers, Iron Fencing, Cresting, Etc. Write for circulars.

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THE KOCH PAT.

SHIFTABLE REVERSIBLE.

BRACKETS.

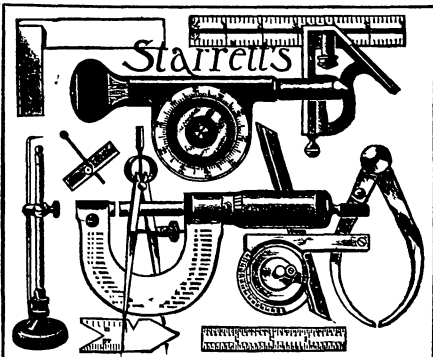
Koch A. B. Co.
518 MAIN ST. PEORIA, ILL.

Skilled mechanics prefer them

Live dealers sell them

STARRETT'S

Best
in
work-
manship
Finest
in
finish
Latest
in
improve-
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For
all
workers
in
metal
or wood
Every
tool
warranted
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tory

FINE TOOLS

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The National Saw Co.,

OPERATING

Wheeler, Madden & Clemson Mfg. Co., Middletown, N. Y. Woodrough & McParlin, Cincinnati, O. Woodrough & Clemson, Boston, Mass. Monhagen Steel Works, Middletown, N. Y. Richardson Brothers, Newark, N. J. Harvey W. Peace Co., Brooklyn, N. Y. Pennsylvania Saw Co., Philadelphia, Pa.

GENERAL OFFICE

96 & 98 READE ST.,

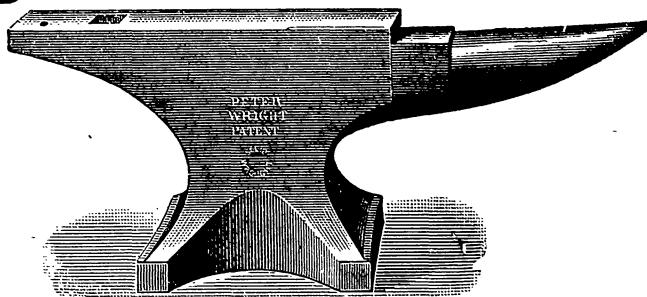
NEW YORK.

SAWS

Peter Wright's Patent Solid Wrought Anvil

PETER
WRIGHT
PATENTSOLID
WROUGHT

Fac-Simile of Trade-Mark.



Fac-Simile of Green Label.

By Royal Letters Patent.

V. R.

PETER WRIGHT'S
SOLID WROUGHT
ANVILMade of Best Scrap Iron
THE BICK FACE AND END ALL
IN ONE SOLID PIECE

You are cautioned in buying to see that each anvil is stamped with the full trade-mark on one side and has the green label affixed to the other.

EXHIBIT STAND No. 167,
GROUP 71.

WORLD'S FAIR.

BRITISH SECTION,
MACHINERY BUILDING.

PETER WRIGHT & SONS, DUDLEY, ENGLAND.

CIRCULAR,
BUTCHER,BAND,
BUCK

SAWS

MANUFACTURED BY

C. A. HILES & CO.,

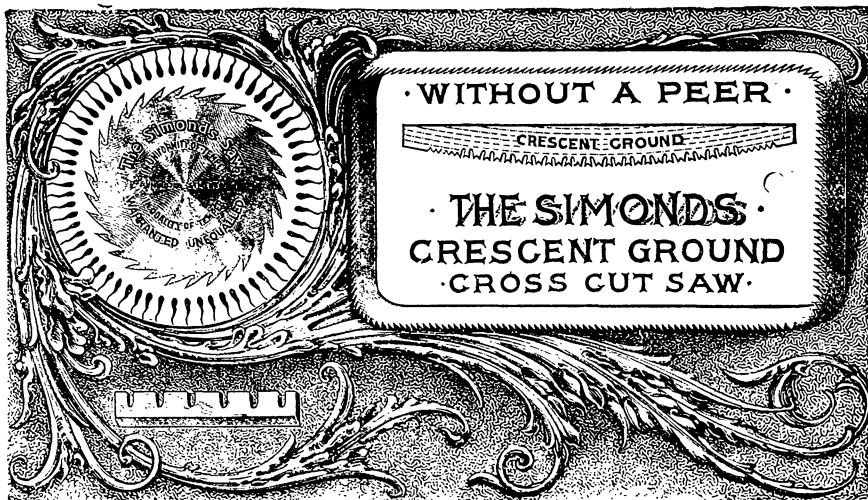
336-338 Carroll Ave. CHICAGO

The Sensible
Saw
Handle.Sample
Sent
Free.Made
only
byCwinner Mfg Co.,
HAMILTON, O.

HARMON & DIXON, Agts., 118 Chambers St., N. Y.

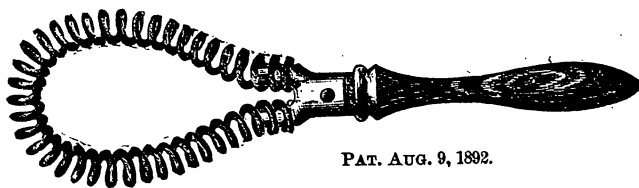
Electric Traction on Railways and Tramways. By A. BECKENZAUN. The author has endeavored in this book to summarize as concisely as possible the present state of electric traction and to describe the various methods and constructive details which are to-day in use or which have marked consecutive steps in the development of the art. 213 illustrations, 12mo, cloth,\$4.00

For sale by DAVID WILLIAMS, 96-102 Reade st., N. Y.



Simonds Mfg. Co. Simonds Saw Co.
FITCHBURG, MASS. CHICAGO, ILL. SAN FRANCISCO CAL. PORTLAND, ORE.

THE BOSS DUST BEATER.



PAT. AUG. 9, 1892.

NEAT, DURABLE, AND DOES THE BUSINESS.

For removing dust and filth from Clothing, Upholstered Furniture, Rugs and Carpets it is just the thing. Will raise the nap and so improve the appearance. Will not, like other Dust Beaters, leave marks, nor tear the fabric. The coil is of steel wire secured in a malleable iron socket and attached to an enameled wooden handle. Just what everybody wants.

Retail Price, 25 Cents. Sent by Mail, 35 Cents.

PEABODY & PARKS,

Manufacturers,

TROY N. Y.

"If you want a Saw it is best to get one with a name on it which has a reputation.
A man who has made a reputation for his goods knows its value as well as its cost and will maintain it."—HENRY DISSTON.

THE SAWS THAT LEAD THEM ALL

DISSTON & SONS' PATENT D-8 HAND SAW.

"THE
SAW;"

HOW

TO

CHOOSE

IT,

AND

HOW

TO

KEEP

IN

ORDER,

Sent

Free

on

Receipt

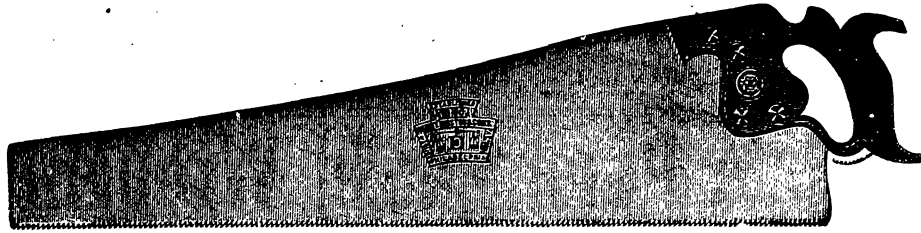
of

Name

and

Post Office

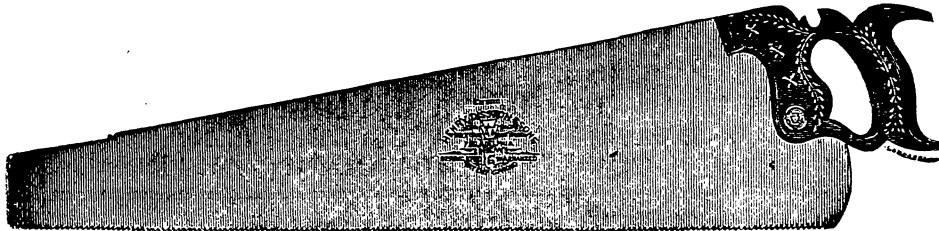
Address.



This Saw combines all the valuable improvements in Hand Saws that have been made by us of late. The first and most important is the hollow or skew back, the success of which can best be attested by the number sold. The peculiar shape of the butt or heel, coupled with the new method of fastening to the handle, give a full stroke of the blade without fear of catching or hooking in the work; and as the handle is put further on the blade you have a full stop on the proper point and a greater command over your Saw, by reason of being two inches nearer the point, which must give more power.

The Saw being let into the handle on a circle, has a perfect bearing, which, with the new screws, makes it stronger and almost impossible to work loose, and avoids the unsightly gap that is seen on the back of the old style handle. All the above features are patented.

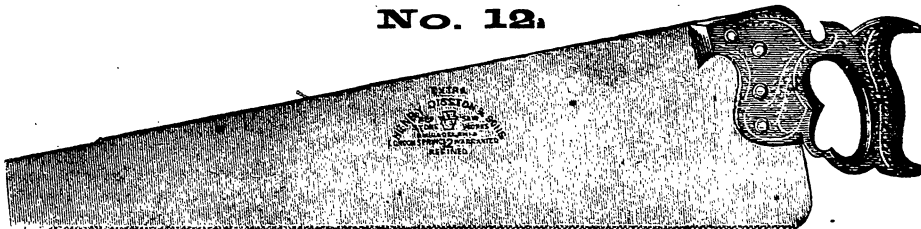
Our New No. 16 Premium Saw.



AN EXTRA FINE SAW IN EVERY RESPECT.

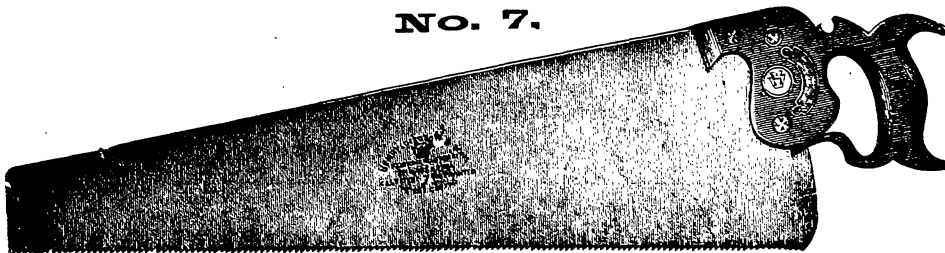
Having the Latest Close up Handle, Spring Steel Blade, Extra Thin Back, Finely Grained, with an Apple Handle and Four Brass Centennial Screws.

No. 12.



DISSTON & SONS' Extra Refined London Spring Steel, Selected and highly Polished Blade, Handle Carved and Polished, 4 Improved Brass Screws, the finest Hand Saw manufactured.

No. 7.



DISSTON & SONS' Cast-Steel, Warranted, Beech Handle, Polished Edge, 4 Improved Screws, Grained Blade.

"POCKET

EDITION

OF

THE

SAWYER "

and

"LUMBER-

MAN'S

HAND

BOOK,"

Sent

Free

on

Receipt

of

Name

and

Post Office

Address

ASK YOUR DEALER TO ORDER THEM FOR YOU.

HENRY DISSTON & SONS

(INCORPORATED),

Keystone Saw, Tool, Steel and File Works, Philadelphia, Pa.

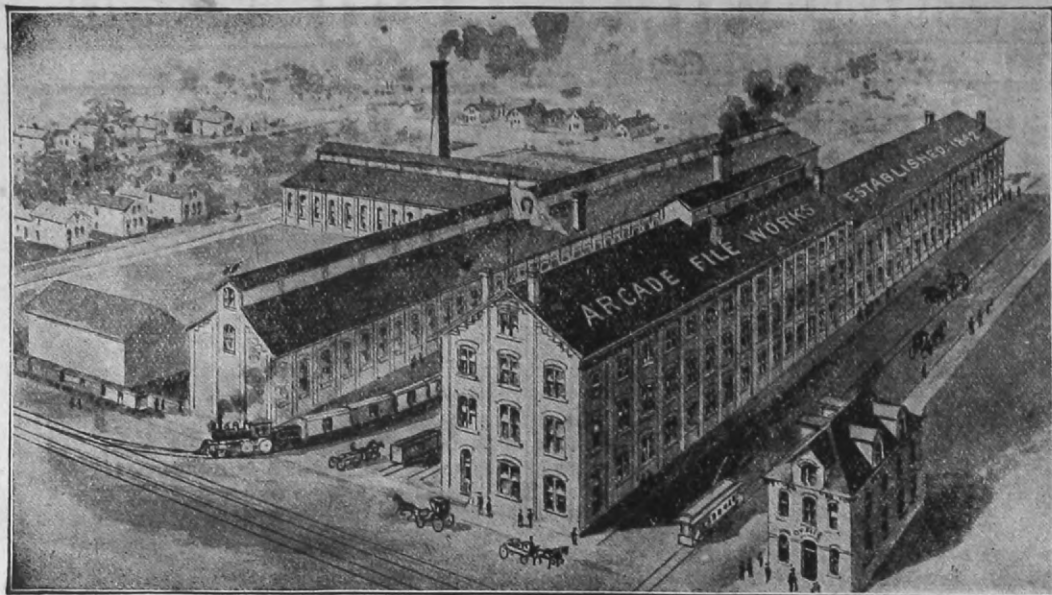
Samuel W. Allerton, Pres.

Courtlandt C. Clarke, Sec. and Treas.

Alfred Weed, Vice-Pres. & Gen. Manager.

ARCADEWORKS, ANDERSON, IND.
ESTABLISHED 1842.**FILE WORKS.**

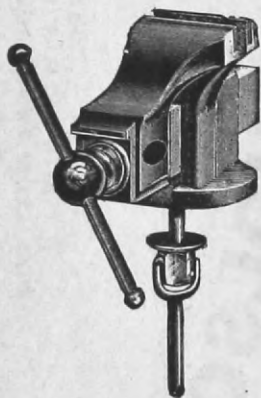
Eastern
Office and
Warehouse,
83 Reade St.,
New York
City.



Western
Office and
Warehouse,
23 Lake St.,
Chicago,
Ill.

THE BEST EQUIPPED FILE WORKS IN THE WORLD.

The fact that we alone use the improved File Machinery recently invented by Alfred Weed, and the even heat of natural gas, enables us to produce a file that will cut faster and wear longer than any on the market.



HOLLANDS' OFFSET JAW VISE.

Specially adapted for drill press work where chucks can not be used and equally good for special or regular bench work.

Hollands Mfg. Co.,
ERIE, PA.,
Manufacturers of
styles VISES.

Philadelphia, 1876.

**McCaffrey File Co.,**

FIFTH and BERKS STS.,

PHILADELPHIA, PA.

For Superiority.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

Break it Down!!!

—IF YOU CAN.—



BRADLEY STEEL SHELF BRACKETS ARE **STRONG, LIGHT, ARTISTIC, PROFITABLE.**

THEY ARE GREAT SELLERS.

"I have **NEVER HAD A CALL** for this bracket," a certain dealer once said to us.

His competitor was taking good care that he should not.

You want **"TO BE IN IT"** this fall. Let us send you our catalogue and prices.

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SOLE MANUFACTURERS.

IT PAYS. Nothing about a Hard ware Store looks so well as clean shelves and the goods neatly boxed with a fresh sample on the front. Customers are attracted by such a display of care, and notice and buy things that would ordinarily go without notice. The Boxes are inexpensive save the goods, make a big show for a small investment and help the salesmen. Send to **JESSE JONES & CO., 615 and 617 Commerce St., Phila., Pa.,** for Catalogue of prices, styles and references.

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TROY, N. Y.

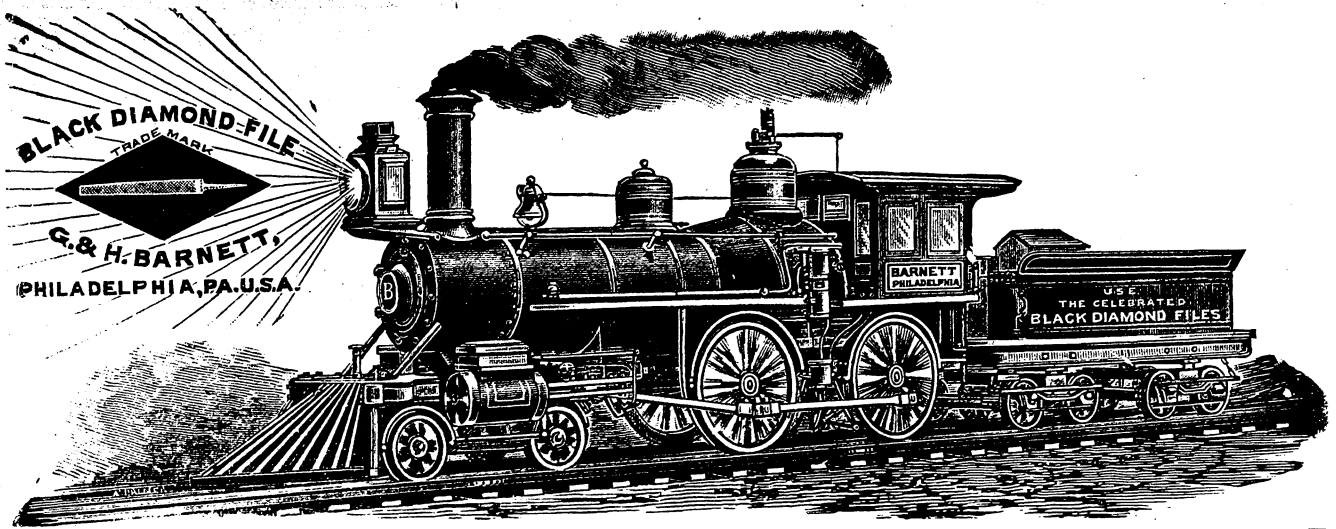
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QUOTE.**The Taintor Positive Saw Set.**

Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

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Manufacturers of

BUTTON'S

**Pat. Wire Cutter
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Specially Adapted for Use on Wire Fence.

Also Manufacturers of BLACKSMITHS' and
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TAPER TAPS, HAND, NUT and SCREW
TAPS, PIPE TAPS and REAMERS.

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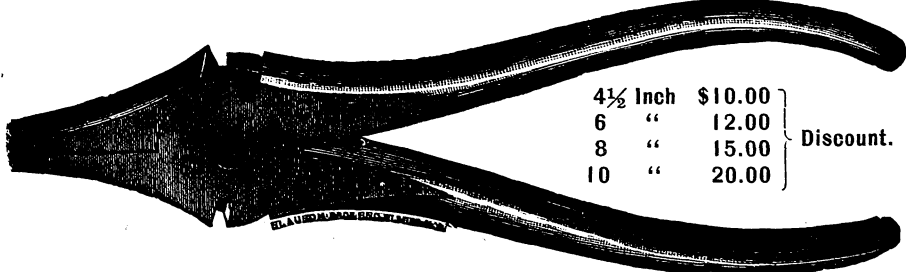
Cronk's Patent Wire Cutter AND Bender.

8 in., \$15.00 } Discount,—
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This surpasses any Plier in the market for Cutting and Bending Wire, and can also be used in place of Hill's Hog Ringer. Is especially adapted to farmers' use in building Wire Fence, &c. Our reasons for claiming that we have the best Pliers in the market are:
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SECOND.—We combine both Flat and Round-Nosed Pliers in one; the concave and convex circles between the handles are used for bending wire in any desired shape.
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FOURTH.—We can cut Barbed Wire, Barb Belt or any kind of Wire used for Fencing purposes. We also claim that we have the only Plier made that the Cutting Jaws cannot be broken.
By passing the Wire through the Pliers it makes a very handy cut and also holds the Wire after it is cut.

C. B. P.



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Blind Hinges, Gate Hinges, Door Butts,
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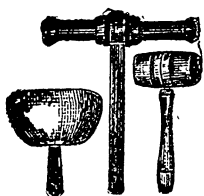
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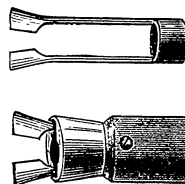
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POINTS:

Fewest parts of any.
No pins to cut.
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Will hold twist drills.
Double the strength.
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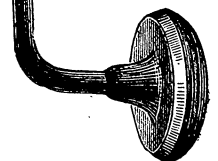
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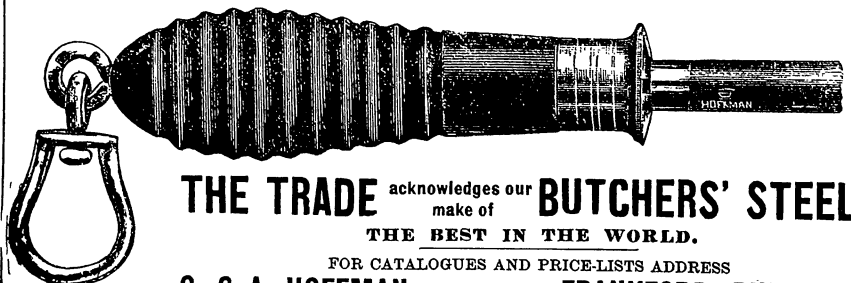
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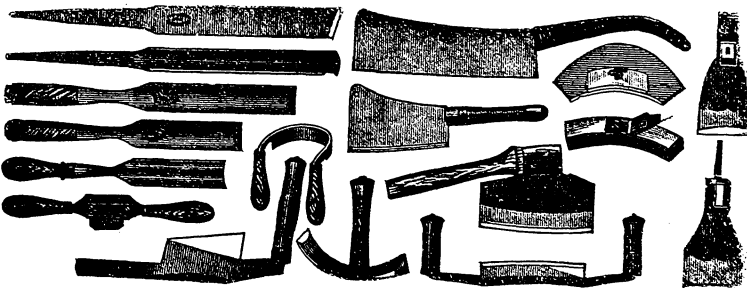
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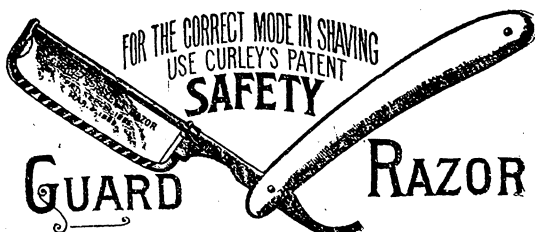
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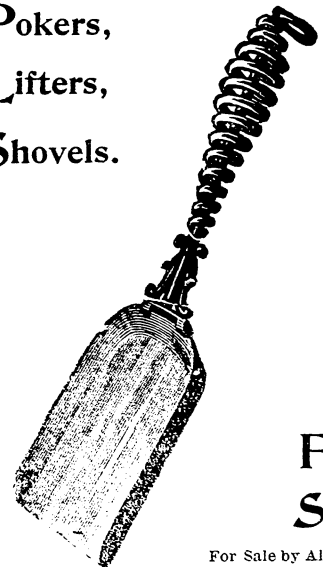
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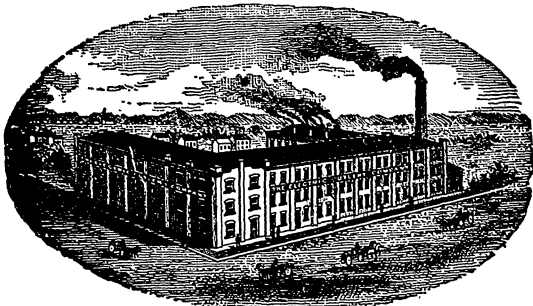
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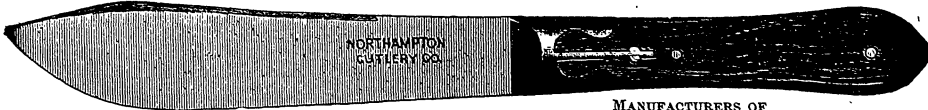
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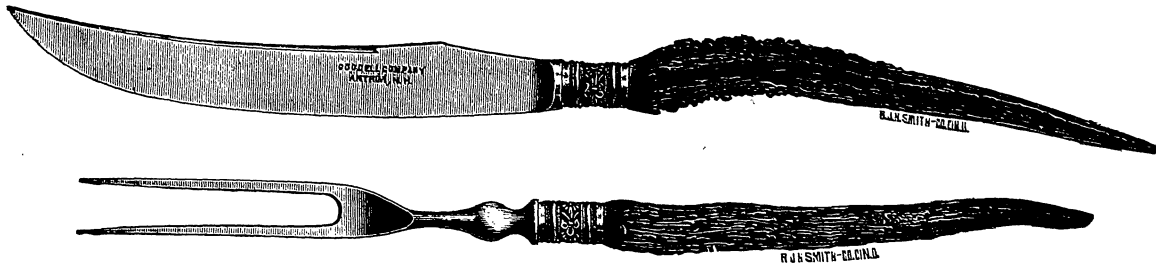
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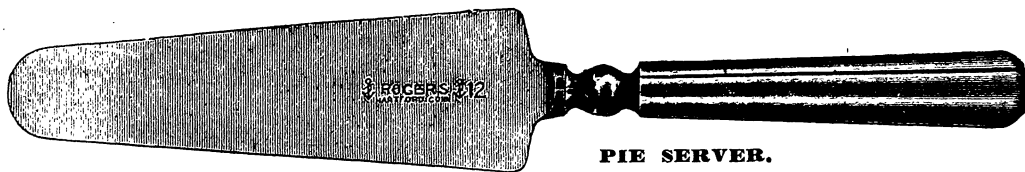
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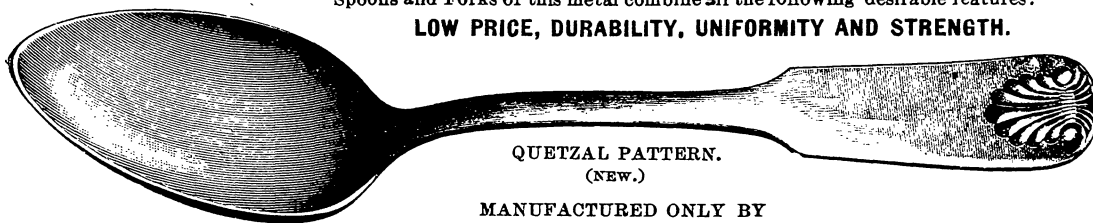
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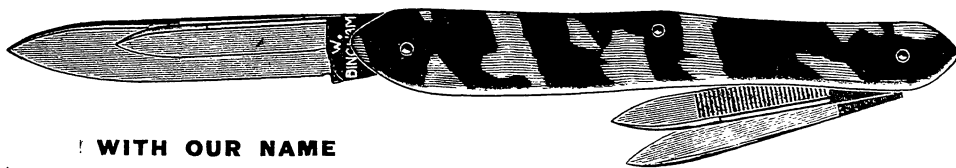
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We make **THE SAGER SPECIAL CHEMICAL PROCESS AXE**, only
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LIGHTNING DRAIN CLEANER.

The Drain Cleaner is a hand machine used as a shovel. The dirt pan is made
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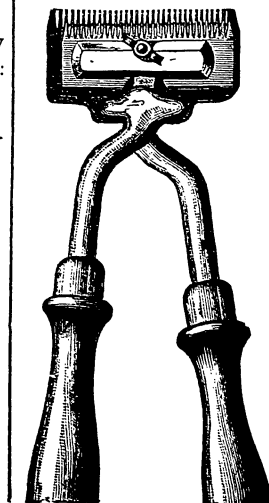
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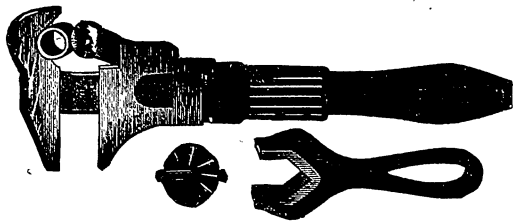
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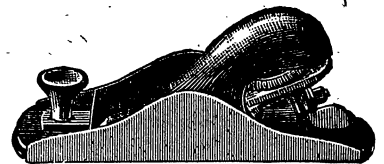
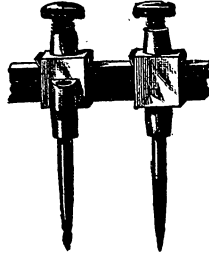
At prices to suit
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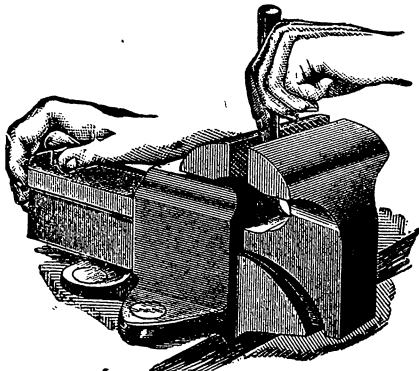
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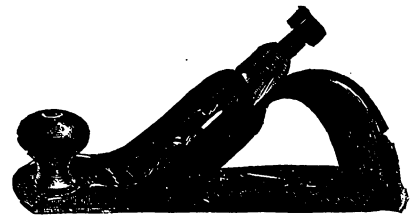
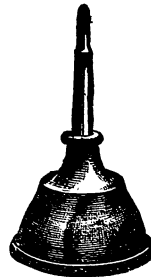
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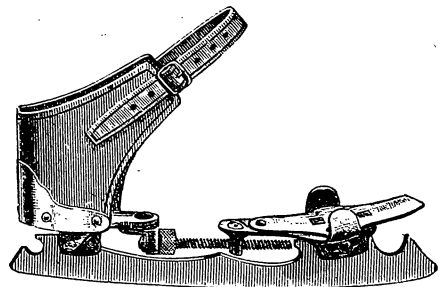
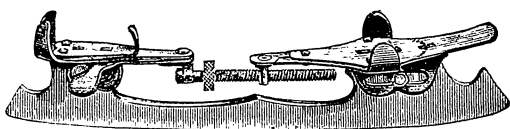
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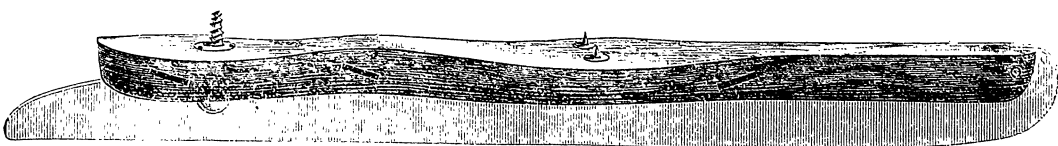
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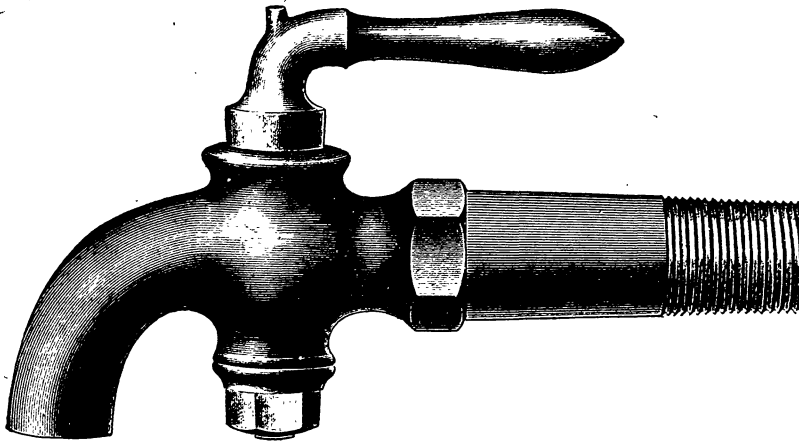


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Standard Petroleum Oil Faucets.



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Write to us for Discounts, we can interest you.

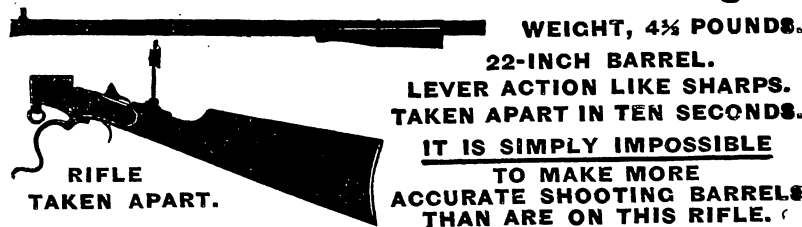
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113 CHAMBERS ST., NEW YORK.

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Made for the 22 or 25 Rim Fire Cartridge.



WEIGHT, 4 $\frac{1}{2}$ POUNDS.
22-INCH BARREL.
LEVER ACTION LIKE SHARPS.
TAKEN APART IN TEN SECONDS.
IT IS SIMPLY IMPOSSIBLE
TO MAKE MORE
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THAN ARE ON THIS RIFLE.

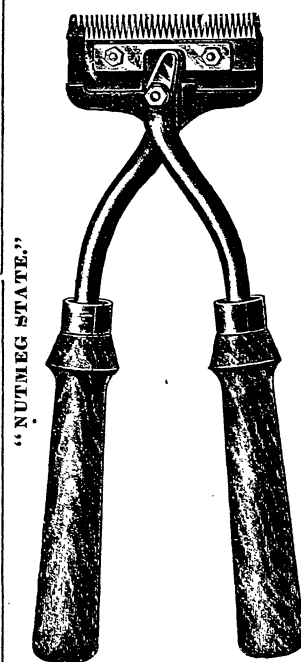
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Also Machinists' Tool Chests, empty. Illustrated Catalogue and prices furnished on application.

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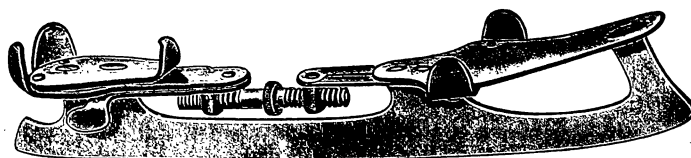
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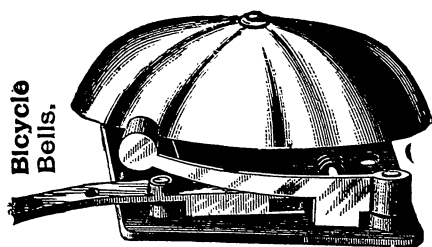
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Especially Low Prices.

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Lightest, Neatest and
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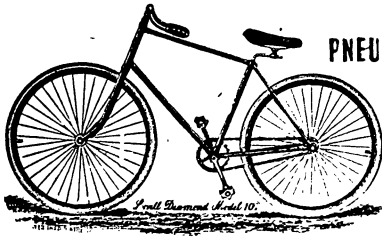
This work is an effort to correct some of the wrong, and consequently unprofitable, methods of conducting manufacturing establishments, and proposes plans for more correct ones. A system of mechanical bookkeeping, based on the card catalogue method, dispensing with the use of books, by which the cost of manufactures may be promptly determined, either in gross or detail, as to component parts and operations thereon. Comprising a simple method of recording all dealings with material which relate to its procurement, expenditure or possession. Applied, with numerous practical illustrations, to the trust, accountability for public property and funds required of the U. S. Ordnance Department, with a review of its present practice. Illustrated with tables, forms of cards, etc.

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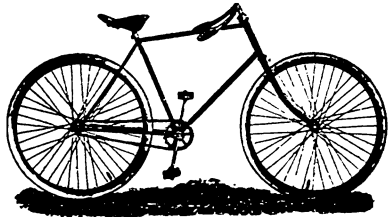


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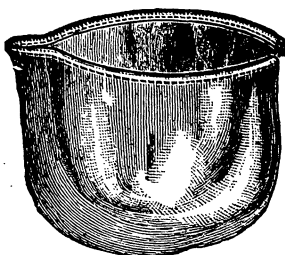
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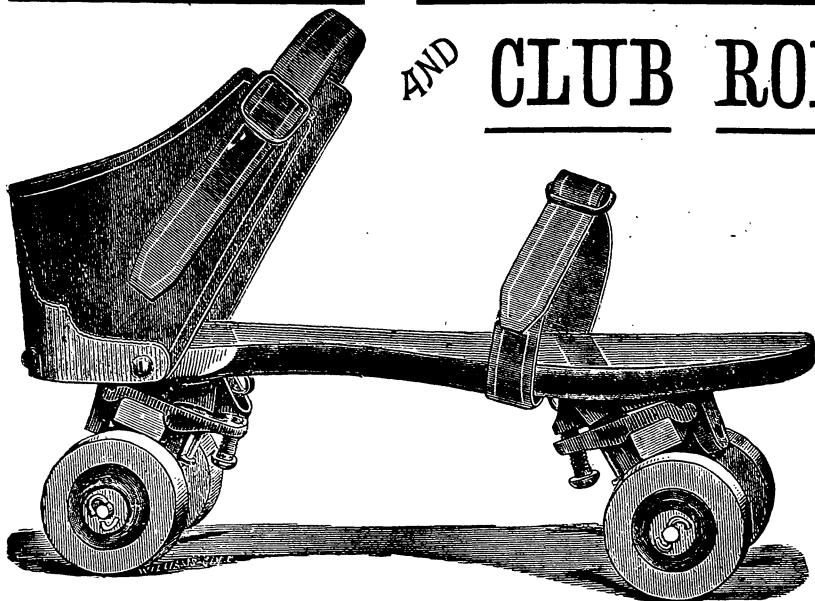
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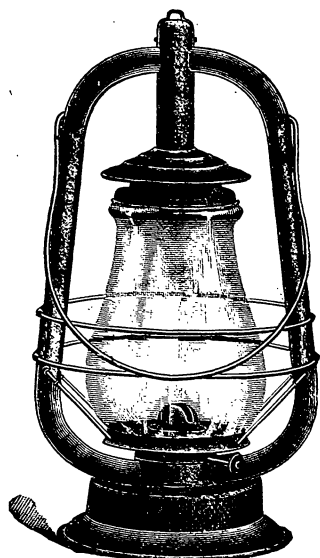
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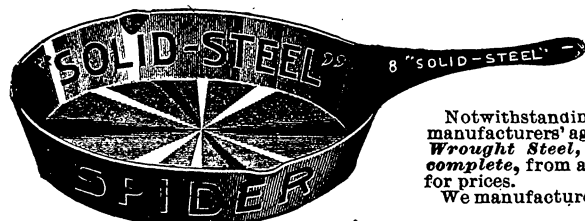
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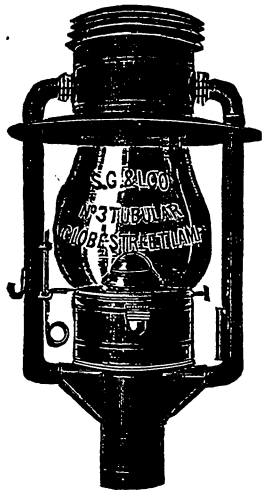
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IS THE Best Street Lamp Manufactured.
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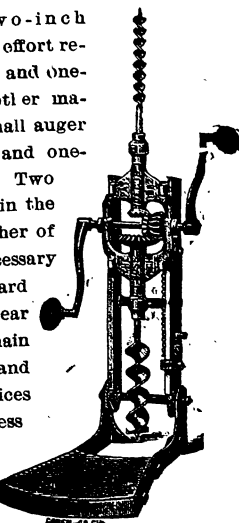
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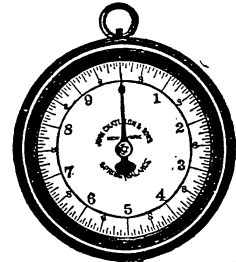
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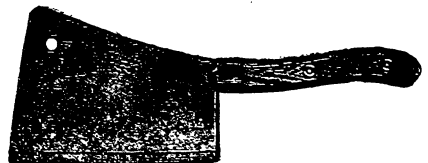
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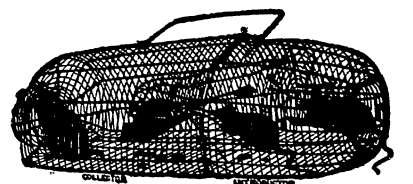
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Beware of Infringements.—We will protect our Patents.

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A New Name, A New Reputation,

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That under the SUN Brand shine as leaders.

RAPID GRINDERS that will STAND THE WEAR.

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A metal of recent discovery for this purpose used solely and only by the SUN. Warranted to outwear, outgrind and outsell any Coffee Mill ever put on the market.

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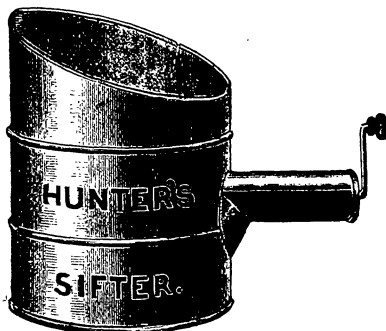
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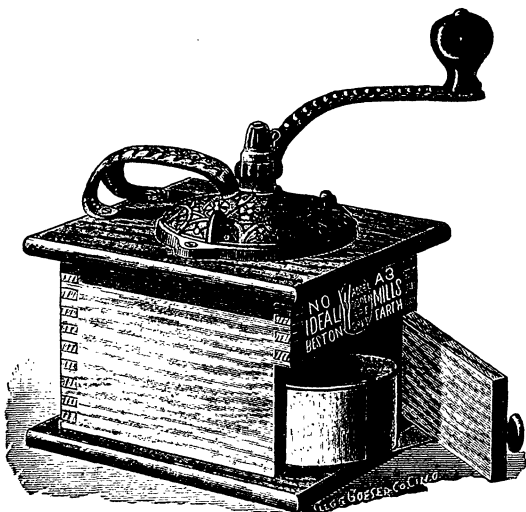
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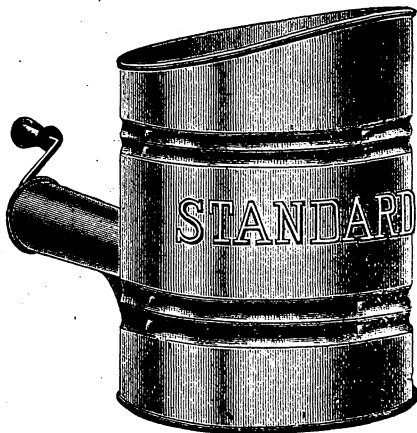
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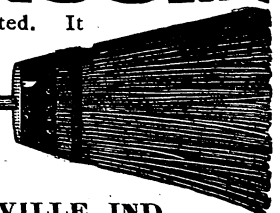
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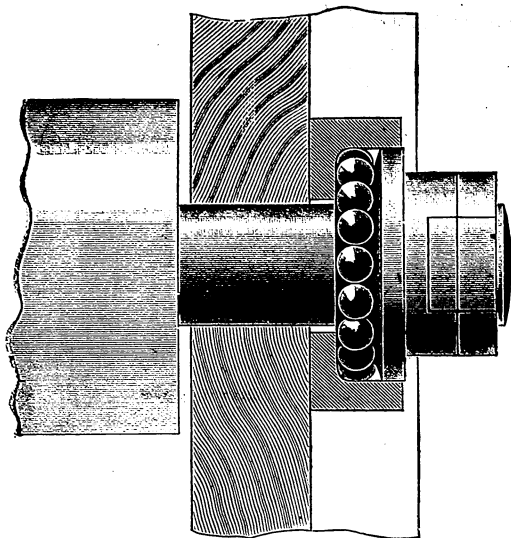
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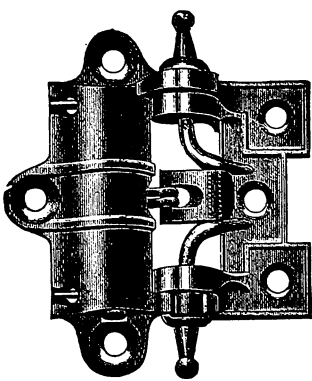
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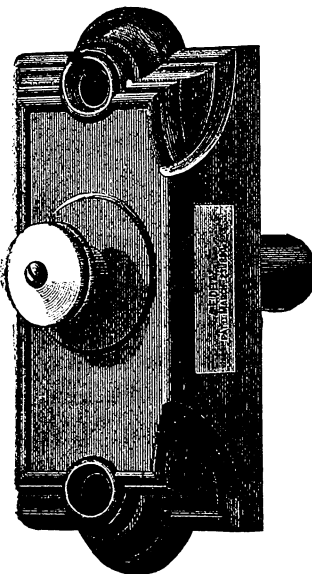
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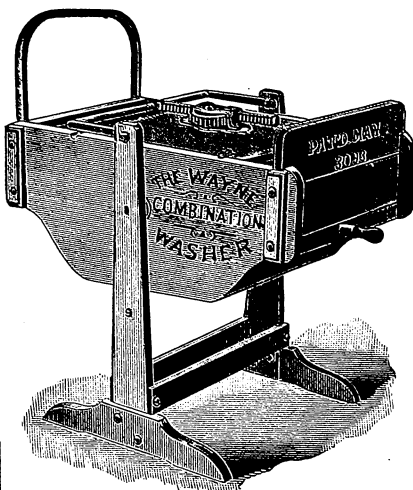


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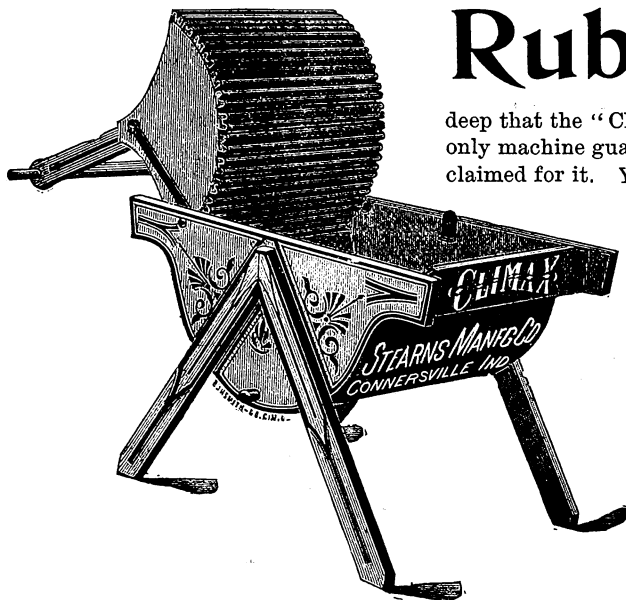


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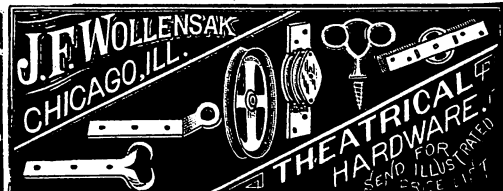
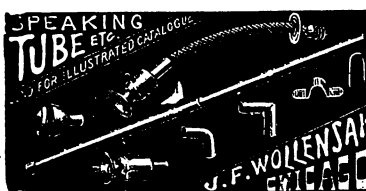
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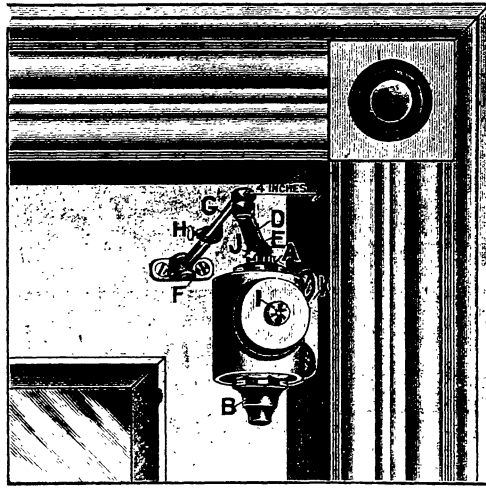
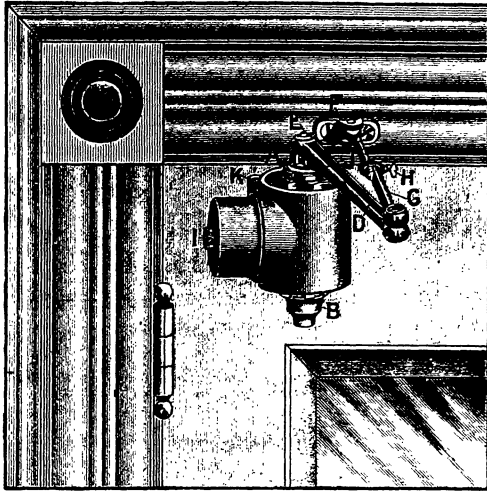
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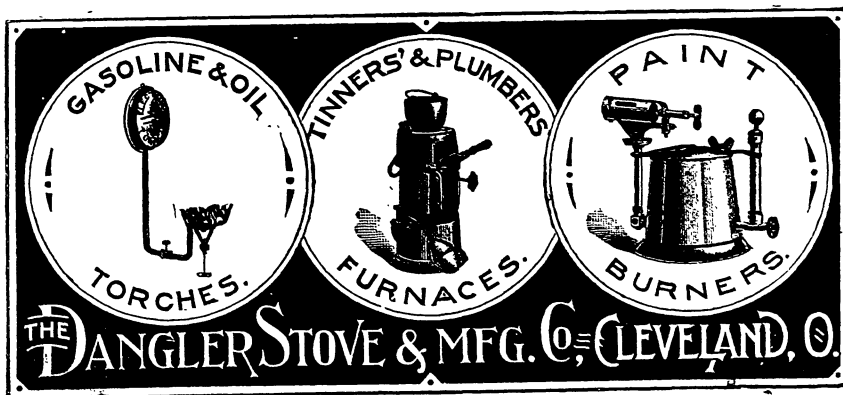


Looks Well,
Acts Well,
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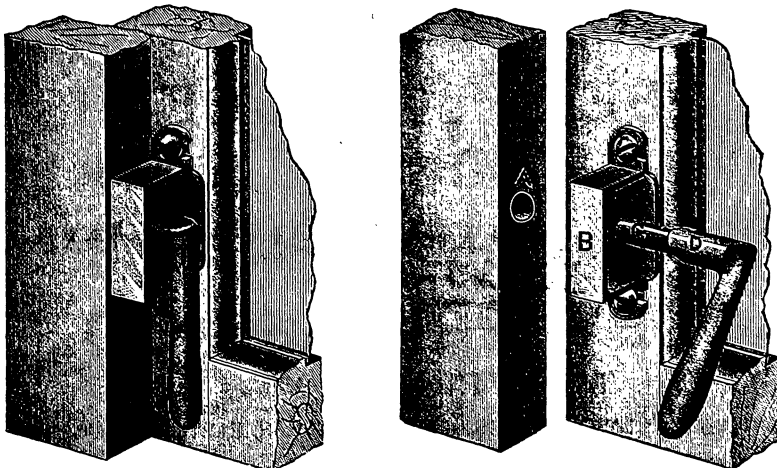
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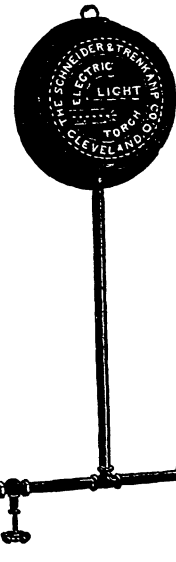
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Saves Time, Labor and Expense.

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Made either for Oil or
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These Torches are particularly adapted for use in factories, foundries, machine shops, rolling mills, blacksmith shops, warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner.
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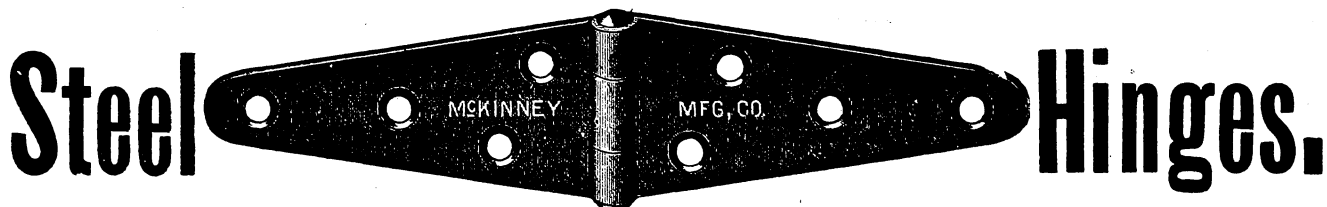
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STEEL STAMPS
For Every Purpose.
Steel Letters and Figures.
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WE CLAIM

That one pair of our Celebrated Steel Hinges will outwear two pair of the Flimsy Invention now being forced upon the attention of the trade.

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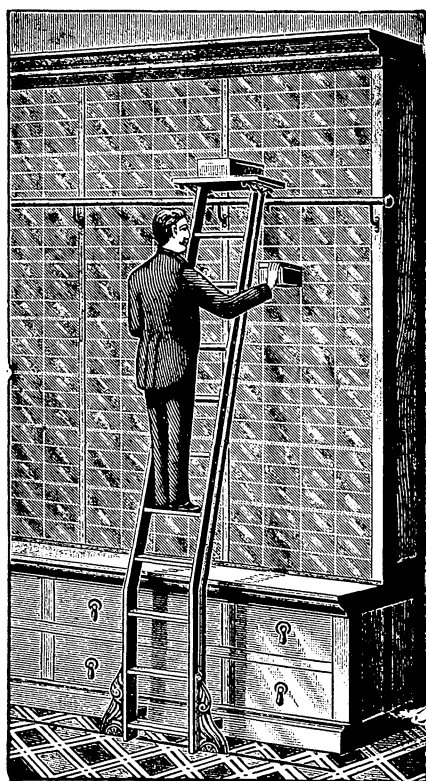


Steel

Hinges.

SEND FOR LIST.

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No other Ladder Service can approach the "Bicycle" in ease and convenience of operation. Compared with others they work like a bicycle beside a lumber wagon.

Can be applied to any kind of shelving made. See this space next week for other styles.

Send for illustrated Catalogue and prices to
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CAN RECOMMEND THE

CHAMPION METAL WINDOW SASH CHAINS

to their customers as a reliable substitute for Sash Cords, very strong and lasting (some in daily use ten years), and gives thorough satisfaction wherever used. The patented attachments are very simple and can be applied to any window.

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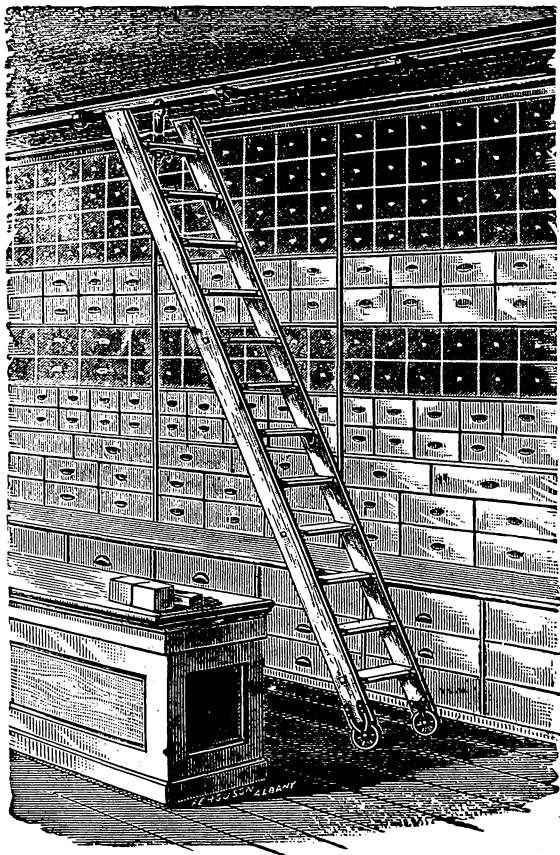
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Write for Prices.

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THE "NOISELESS" STORE LADDER.



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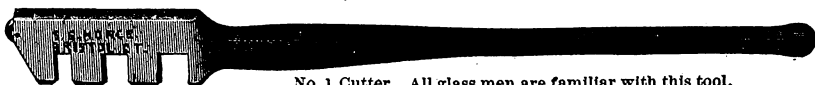
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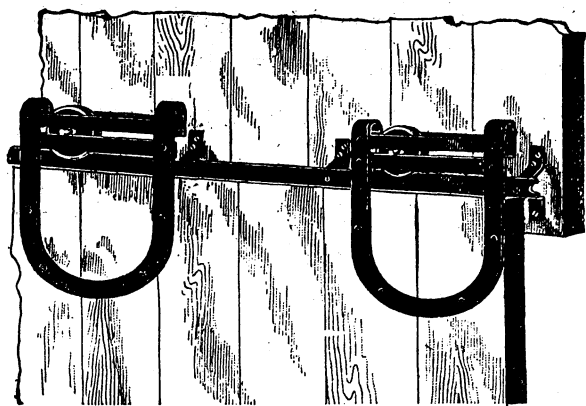
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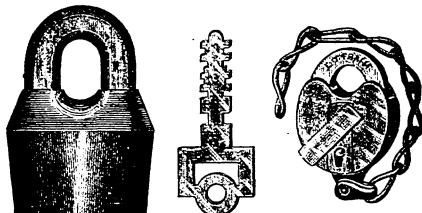
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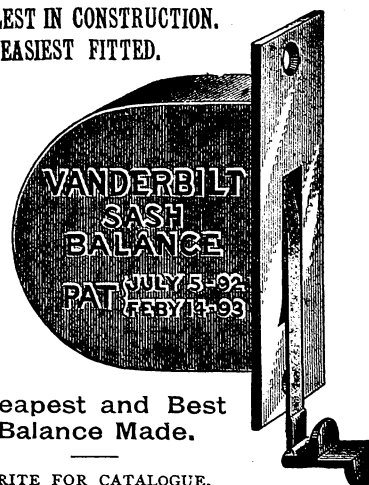
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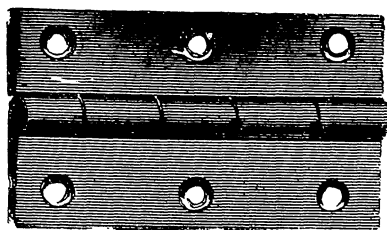
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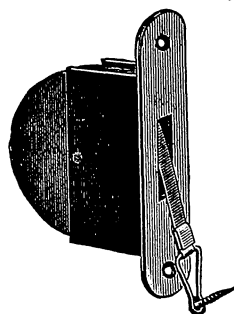
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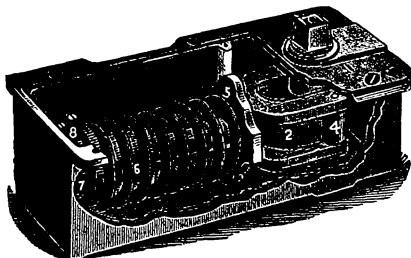
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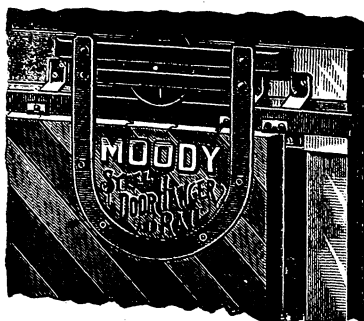
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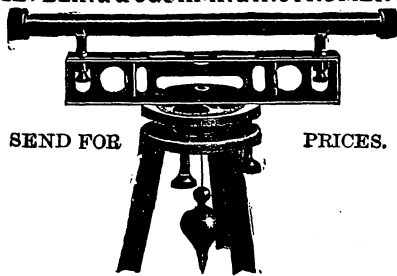
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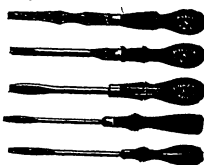
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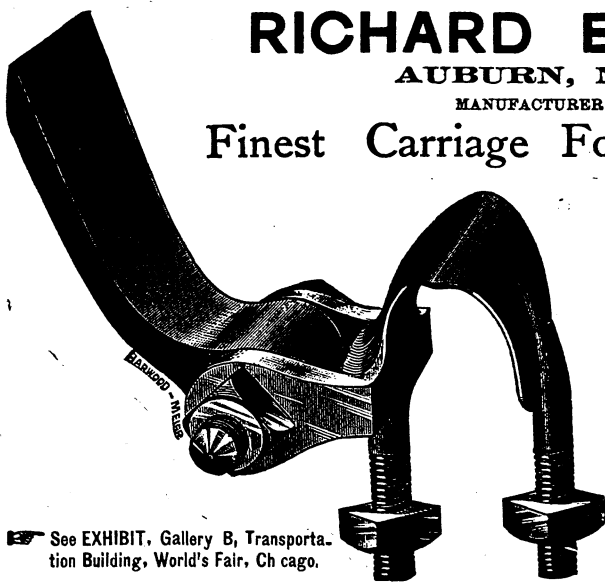
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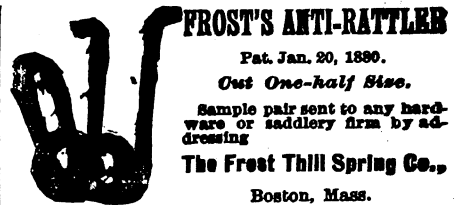
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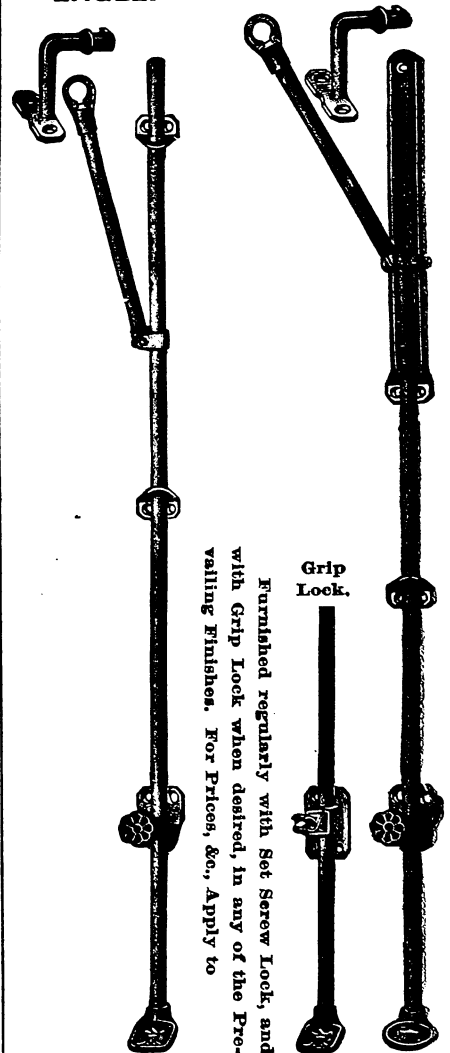
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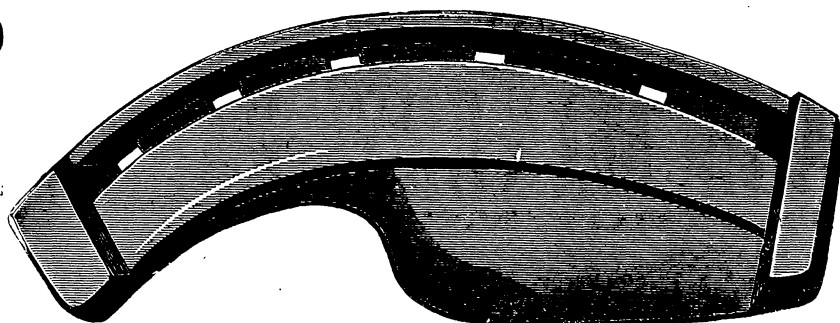
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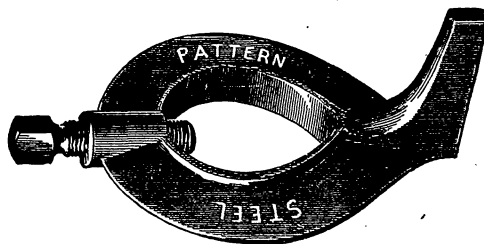
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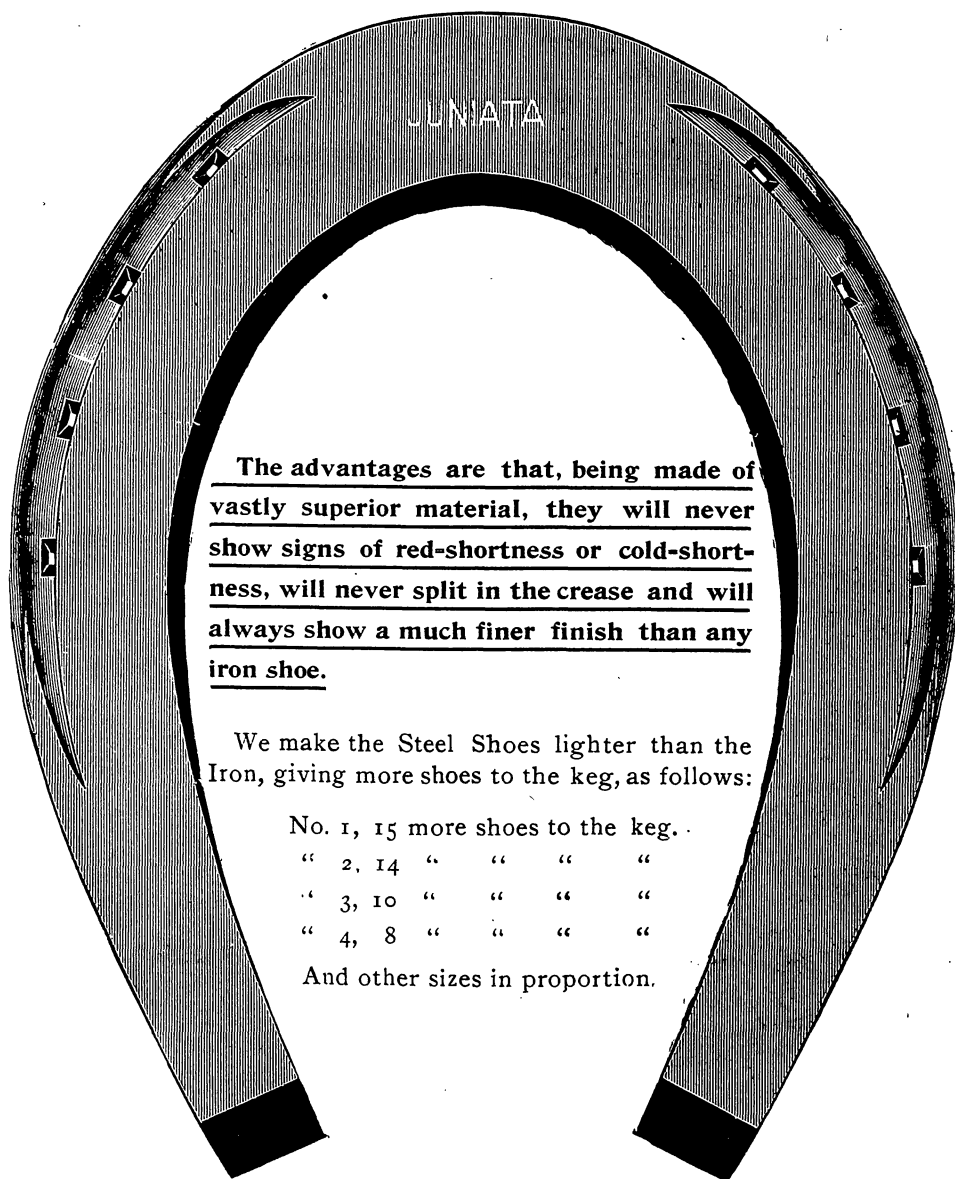
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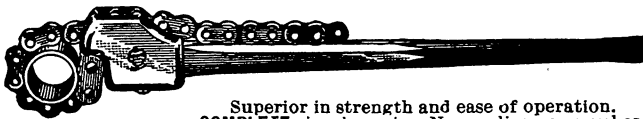
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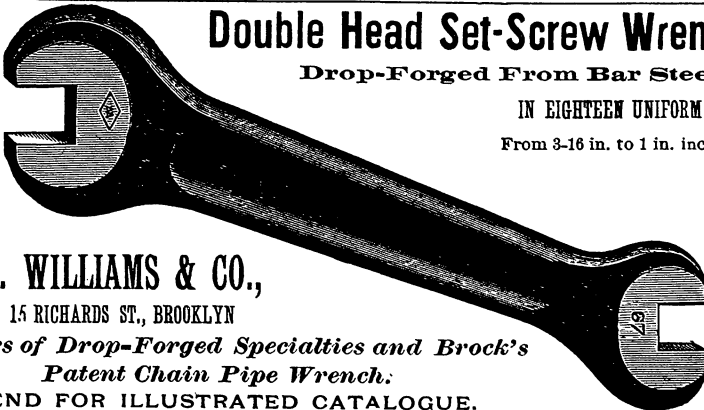
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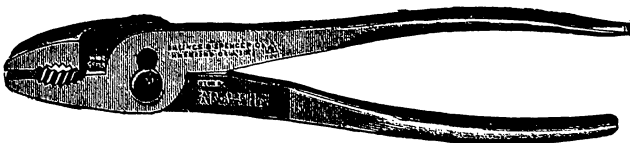
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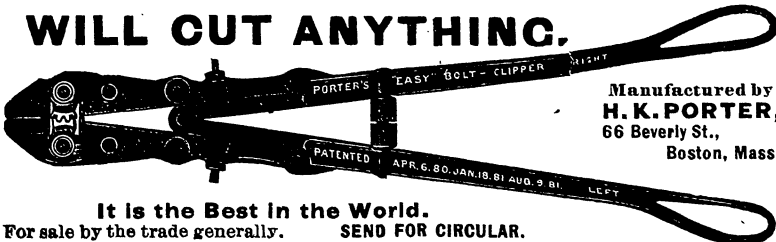
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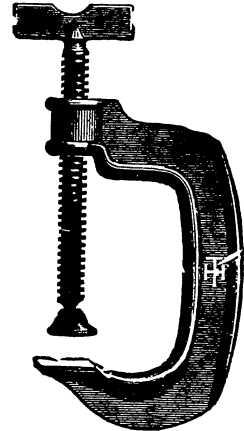
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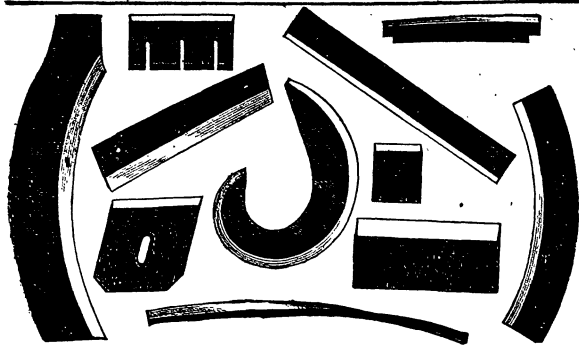
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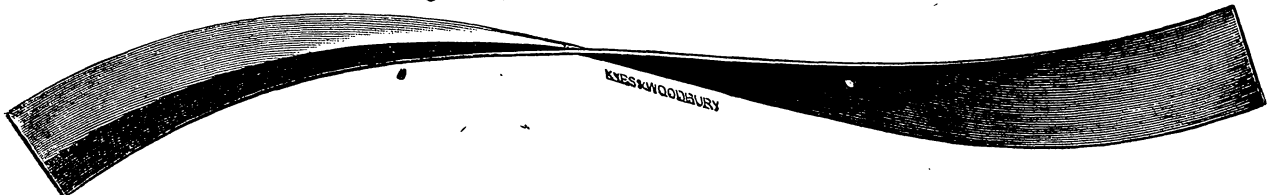
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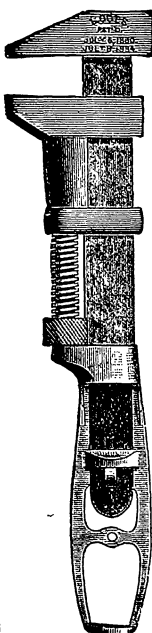
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Bright Finish.**HERCULES**
Combination Bolt and Nut Wrench. Bright Finish.

This Screw Driver is made from one piece of special cast steel, in all sizes, from 1 1/4 in. to 12 in. The blade is well polished, carefully tempered, and every screw driver is subjected to a severe test and warranted. Handles Japanned with the best quality baking Japan.

The Strongest and Most Durable Wrench and Screw Driver Made.

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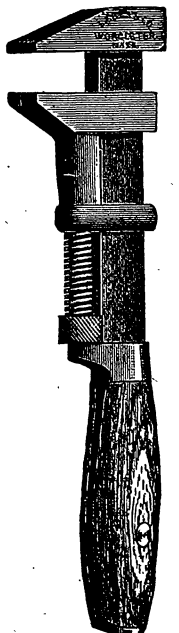
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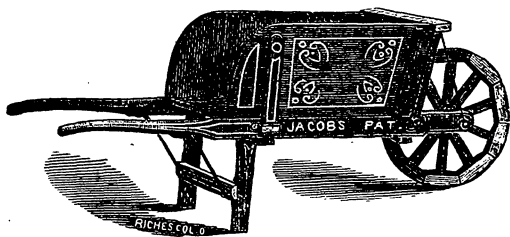
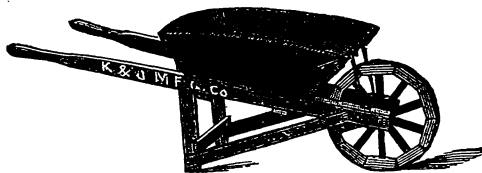
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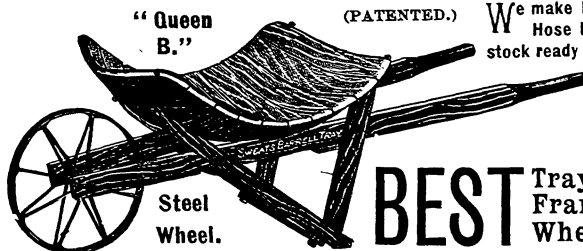
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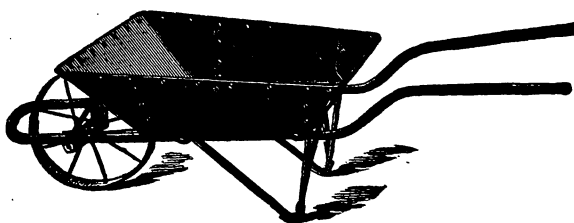
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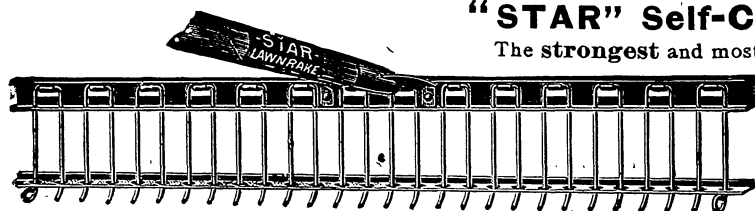
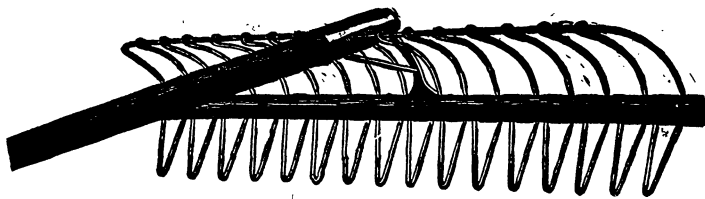
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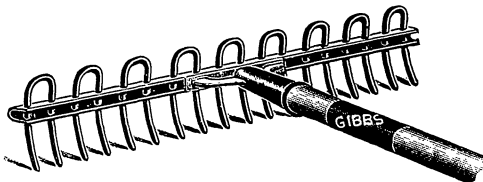
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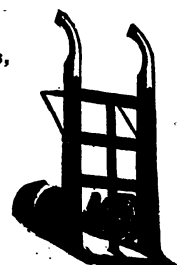
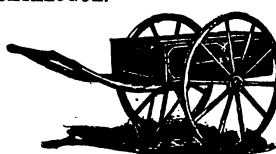
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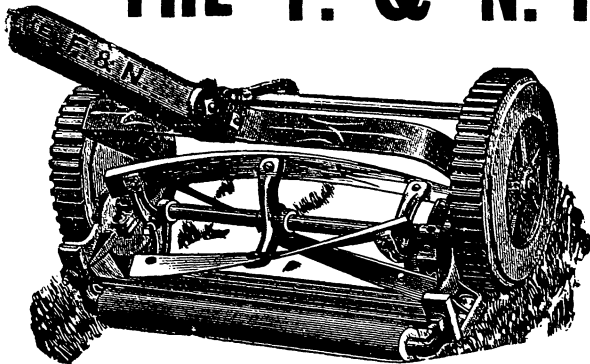
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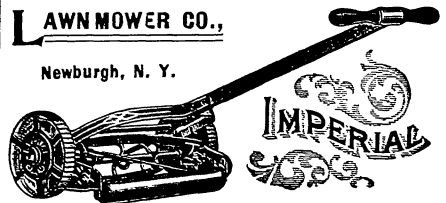
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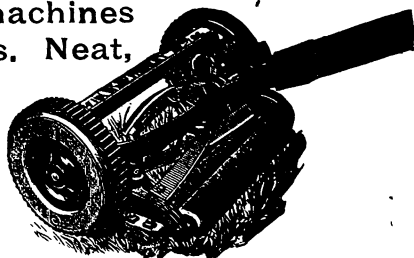
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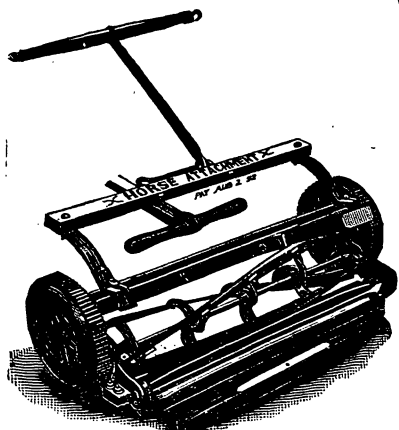
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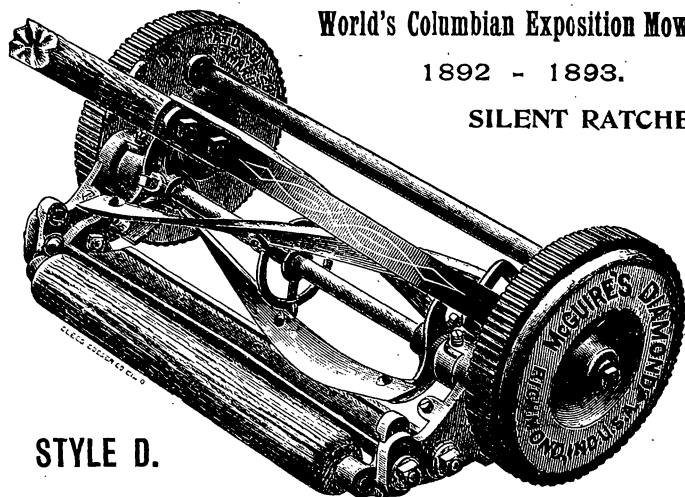
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Just Published.—THIRD REVISED EDITION. THE IRON AGE STANDARD HARDWARE LISTS FOR USE IN PRICE BOOKS.

Compiled by R. R. WILLIAMS, Hardware Editor of The Iron Age.

This pamphlet contains the principal standard Hardware price-lists in as clear and compact an arrangement as possible, so as to permit their being advantageously cut out and inserted in the price book. In order to make them adapted to this use they are printed on thin and tough paper of fine quality and on only one side of the paper.

Saucepans and Round Boilers.

Pints.	Plain	Turled.	Tin'd or En'd.
1	\$0.30	.35	.39
1½	.32	.37	.44
2	.35	.39	.48
3	.42	.47	.56
Quarts.			
2	.50	.56	.63
2½	.53	.59	.68
3	.55	.62	.73
4	.60	.68	.84
5	.65	.75	.96
6	.70	.81	1.11
7	.75	.84	1.21
Gallons.			
2	.85	.96	1.31
2½	1.05	1.18	1.56
3	1.20	1.35	1.70

The success of the effort to give the lists in small space is illustrated in many of the lists, in which a clear and condensed arrangement is secured. For instance, the wrench list occupies but 3 inches by ½ inch, while the list of Stove Hollow Ware, in very small space, gives the list prices on a large and important line of goods which often occupy several pages in catalogues. In several lists, such as Strap and T Hinges and Butts, a new arrangement is adopted, which is regarded as presenting these lists in a very convenient as well as condensed form.

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3½ x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Stove Hollow Ware.

POTS, KETTLES, ETC. (CAST IRON.)							Ground and Unground.
No.	6	7	8	9	10	11	
Pots.....	\$0.65	.75	.85	1.00	1.25	1.75	
Kettles.....	.55	.65	.70	.85	1.00	1.40	
T Kettles.....	.75	.80	.90	1.00	1.25	....
Spiders.....	.27	.30	.35	.40	.50	.60	
Griddles Round	.22	.25	.27	.30	....	....
" Long..	.40	.50	.60	.75	....	....

SCOTCH AND YANKEE BOWLS.

No.	1	2	3	4	5	6
Scotch Bowls..	\$0.35	.40	.45	.50	.60	.70
Yankee Bowls.	.35	.45	.55	.65	.75	.90

Wrenches.

Inches.	6	8	10	12	15	18	21
Black...	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00

Some merchants use this pamphlet for reference, checking off invoices, etc., as it gives the leading lists in a more convenient form than they can otherwise be obtained. The lists are, however, intended primarily to be cut out

Glue Pots.

No.	4/0....	\$4.50	No. 2	....	\$8.40
3/0....	5.00		3	....	10.26
2/0....	5.50		4	....	12.42
0	6.00		5	....	14.58
1	6.75		6	....	16.94

and inserted in price books, and can be used in connection with any of The Iron Age Hardware Price Books.

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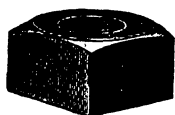
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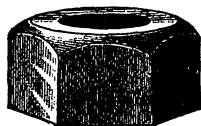
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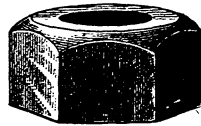
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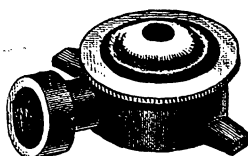
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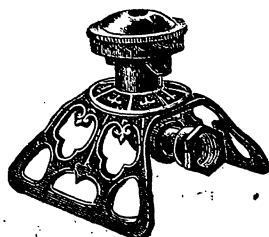
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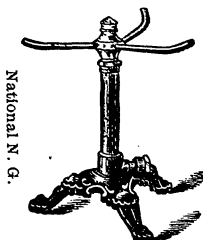


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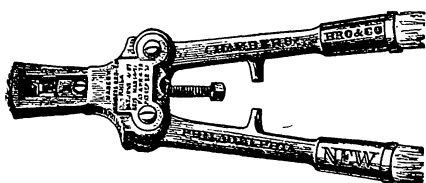
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Electro-Platers.

Boardman, L. & Son, East Haddam, Ct.

Elevators. Makers of.

Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.
Salem Fdry & Mch. Co., Salem, Mass.

Emery and Emery Wheels.

Bell, Geo. E., 38 John St., N. Y.
Grant Corundum Wheel Mfg. Co., Worcester, Mass.
N. Y. Belting & Packing Co. Ltd., N. Y.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Sterling Emery Wheel Co., 174 Fulton St., New York.

Enamels.

Nubian Iron Enamel Co., Cragin, Ill.

Engineers and Contractors.

Aiken Henry, Pittsburgh, Pa.
Artificial Gas Engineering Co., Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. R. Co., Pittsburgh, Pa.
McClure, Amster & Co., Pittsburgh, Pa.
Pittsburgh Iron & Steel Engineerin Co., Pittsburgh, Pa.
Roberts, Frank C., Philadelphia, Pa.
Smythe, S. R. Co., Incorporated Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.
Witherow, Jas. P. Co., Pittsburgh, Pa.

Engines, Gas.

Otto Gas Engine Works, Phila., Pa.
Rollason Gas Engine, Havemayer Bldg., N. Y.

Engines, Steam. Makers of.

Bass Foundry & Machine Works, Ft. Wayne, Ind.
Buckeye Engine Co., Salem, O.
Erie Engine Works, Erie, Pa.
Lane & Bodley Co., Cincinnati, O.
Norwalk Iron Works Co., So. Norwalk, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, a.
Phila. Engineering Works, Phila., Pa.
Phoenix Iron Wks. Co., Meadville, Pa.
Shipman Engine Co., Boston, Mass.
Southwark Foundry and Machine Co., Phila., Pa.
Tod, William A. Co., Youngstown, O.
Wetherill, Robt. & Co., Chester, Pa.

Exhaust Tumblers.

Sweester, W. A., Brockton, Mass.

Expansion Belts.

Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.

Faucets, Self-Measuring.

Lane Bros., Poughkeepsie, N. Y.

Faucets, Wooden. Makers of.

Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.
John Sommer's Son, Newark, N. J.

Feed-Water Heaters.

Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 32 Cortlandt St., N. Y.
Harr son Safety Boiler Wks., Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Webster, Warren & Co., Camden, N. J.
Whitlock Coil Pipe Co., Elmwood, Conn.

Fencing, Iron and Wire.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clinton Wire Cloth Co., Clinton, Mass.
DeKalb Fence Co., DeKalb, Ill.
Gilbert & Bennett Mfg. Co., 42 Cliff St., Hartman Mfg. Co., Ellwood City, Pa.
Kilmer Mfg. Co., Newburgh, N. Y.
Maat, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
Reliance Wire & Iron Wks., Milwaukee

Files. Importers of.

Moss, F. W., 80 John, N. Y.

Files and Raps. Manufacturers of.

Arcade File Works, Anderson, Ind.
Banker & White, Troy, N. Y.

Barnett, G. & H., 41 & 43 Richmond, Phila.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence R. I.

Fire Brick. Makers of.

Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer B & Sons, Foot E. Houston, St. McLeod & Henry Co., Troy, N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro., Woodbridge.

Fire Sets.

Troy Nickel Works, Troy, N. Y.

Fishing Tackle.

Dame, Stoddard & Kendall, Boston, Mass.

Flint and Emery Paper.

Baeder, Adamson & Co., Phila., Pa.

Flour Sifters.

Meyers, F. J. Mfg. Co., Covington, Ky.
Sills, W. H., 81 Lake St., Chicago, Ill.

Flower Stands.

Cincinnati Mfg. Co., Cincinnati, O.

Flue Cleaners.

Mackey, Jas. T., St. Louis, Mo.

Fodder Cutters.

Silver Mfg. Co., Salem, O.

Foreign Periodicals.

Stechert, G. E., 310 Broadway, N. Y.

Forces, Portable. &c.

Bullock Bellows Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Empire Portable Forge Co., Lansingburgh, N. Y.
Sturtevant, B. F. Co., Boston, Mass.

Forgings, Iron and Steel.

Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel—Cambria Iron Co., Johnstown, Pa.
Seranton Forging Co., Seranton, Pa.

Foundry Facings.

Paxson, J. W. & Co., Phila.
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.

Foundry Kiddles.

Estey, W. S., 65 Fulton, N. Y.

Foundry Supplies.

Colliau, Victor, Detroit, Mich.
S. Obermayer Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia.
Smith, J. D. Fdy. Supply Co., Cinn., O.

Friction Clutches.

Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.

Friction Cone.

Evans Friction Cone Co., Boston, Mass.

Fruit Pickers.

Cleveland Novelty Co., Cleveland, O.

Fruit Presses.

Enterprise Mfg. Co., Philadelphia, Pa.

Gas Producers.

Wood, R. D. & Co., Philadelphia, Pa.

Gas & Steam Fitters' Supplies.

Pancoast, Henry B. & Co., Phila., Pa.

Gauge, Rolling Mill.

Haines Gauge Co., Philadelphia, Pa.

Gear Cutters.

D. E. Whitton Mach. Co., New London, Conn.

Gears.

Aoston Gear Works, Boston, Mass.
Gleason Tool Co., Rochester, N. Y.
New Process Raw Hide Co., Syracuse, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.

Glass Cutters.

Monce, S. G., Bristol, Conn.

Glass Tubes.

Ashcroft Mfg. Co., 111 Liberty St., N. Y.

Glue.

Baeder, Adamson & Co., Phila., Pa.
Kussia Cement Co., Gloucester, Mass.

Grass Catchers.

Supple Hardware Co., Phila., Pa.

Grinding and Polishing Machines.

Herrick & Cowell, New Haven, Conn.
Norton Emery Wheel Co., Worcester, Mass.
Washburn Shops, Worcester, Mass.

Grindstone Dressing Machinery.

Blake & Johnson, Waterbury, Conn.

Grindstones.

Cleveland Stone Co., Cleveland, O.

Gun Implements.

Union Hd. Co., Torrington, Conn.

Gunpowder. Makers of.

Lafin & Rand Powder Co., 29 Murray St., N. Y.

Hand Carts.

Lansing Wheelbarrow Co., Lansing, Mich.

Handles.

New Process Raw Hide Co., Syracuse, N. Y.
New York Mallet and Handle Wks., 456 E. Houston St., N. Y.

Hangers, Door.

Crone Hanger Co., Elmira, N. Y.
Lane Bros., Poughkeepsie, N. Y.
Victor Mfg. Co., Newburyport, Mass.

Hardware Comm'n Merchants.

Doscher, Martin, 88 Chambers, N. Y.
Field, Alfred & Co., 93 Chambers St., N. Y.
Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N. Y.

Hardware Manufacturers.

Hotchkiss, E. S., Bridgeport, Conn.
Seearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.

Hardware Mfrs. Agents.

Bingham, W. Co., Cleveland, O.
Graham, John H. & Co., 113 Chambers, McCoy, Jos. E. Co., 28 Warren St., N. Y.
Sickles Sweet & Lyon, 35 Barclay, N. Y.
Underhill, Olmick & Co., 24 Chambers St., N. Y.

Hardware Specialties.

Acme Shear Co., Bridgeport, Conn.
Belden Machine Co., New Haven, Conn.
Clark Mfg. Co., Buffalo, N. Y.
Empire Portable Forge Co., Lansingburgh, N. Y.
Enticard, Brown & Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Gwinner Mfg. Co., Hamilton, O.
Haines & Zimmerman, Phila., Pa.
Hart, H. C. Mfg. Co., Detroit, Mich.
Johnson, S. C., Racine, Wis.
Knapp & Cowles Mfg. Co., Bridgeport, Conn.
New Britain Hd. Mfg. Co., New Britain, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
Peabody & Parks, Troy, N. Y.
Shepard, Sidney & Co., Buffalo, N. Y.
Welland, Chas., 119 Chambers St., N. Y.
Wilson, J. Fred, Worcester, Mass.
Underhill, Olmick & Co., 24 Chambers Street, N. Y.

Hardware, Yacht and Ship.

Ferdinand, L. W. & Co., Boston, Mass.

Harness Snaps.

Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.

Hay Knives.

Holt, Hiram Co., E. Wilton, Me.

Holting Machines.

Box, Alfred & Co., 314 Green, Phila.
Jrown Holting & Conveying Mch. Co., Cleveland, Ohio.
Copeland & Bacon, 85 Liberty St., N. Y.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E. Son & Co., Phila.
Lane Bros. Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 96 Liberty, N. Y.
Maris & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Spedel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.

Hollow Ware.

Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.

Hollow Ware, Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.

Horse and Barbers' Clippers.

Hotchkiss, E. S., Bridgeport, Conn.

Horse Nails. Makers of.

National Horse Nail Co., Vergennes, Vt.

Horse and Mule Shoes. Makers of.

Bryden Horse Shoe Co., Catsaquaga, N. Y.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Diamond State Iron Co., Wilmington, Del.
O. C. Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.

Hose.

N. Y. Belting & Packing Co. Ltd., 15 Park Row, N. Y.
McLean, John, 296 & 298 Monroe, N. Y.

Hydrants, &c.

Dudgeon, Richard, 24 Columbia, N. Y.
Watson & Stillman, 204 E. 43d, N. Y.

Ice-Cream Freezers.

North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.

Ice Shavers.

Enterprise Mfg. Co., Philadelphia, Pa.

Injectors.

Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York
Sherwood Mfg. Co., Buffalo, N. Y.

Insurance, Boiler.

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

Iron and Steel, Swedish.

Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.

Corning, Edw. & Co., 39 B'way, N. Y.
Cotton, Bradley & Co., Philadelphia.
Etting, Edw. J., Philadelphia.
Hoffman, John J. & Co., Philadelphia, Pa.
Hoffman, John J. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Kesley, Jerome & Co., Philadelphia.
Lee, J. Tatnall & Co., Philadelphia.
Mohr, J. J., 480 Walnut, Philadelphia.
Phillips & Crane, Philadelphia, Pa.
Sibell, Geo. H. & Co., Chicago, Ill.
Wister, L. & H. & Co., Phila., Pa.

Iron Ore.

Naylor & Co., 45 Wall, N. Y.
Pickands, Brown & Co., Chicago, Ill.
Pullman, J. Wesley, Phila., Pa.
Samuel, Frank, Philadelphia, Pa.

Iron, Merchants.

Barnes, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Busenius & Cunliffe, Philadelphia.
Corning Edw. & Co., 29 B'way, N. Y.
Cox Justice Jr., Philadelphia.
Cotton, Bradley & Co., Philadelphia.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Naylor & Co., 45 Wall St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 86 Elm St., N. Y.
Pickands, Brown & Co., Chicago, Ill.
Pierston & Co., 29 Broadway, N. Y.
Richards, D. W. & Co., 88 Maning St., N. Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.

Iron, Importers.

Abbott Wheelock & Co., N. Y. and Boston
Lundberg, Gustaf, Boston, Mass.

Iron, Sheet. Manufacturers of.

Cambridge Iron & Steel Co., Cambridge Ohio
W. Dewees Wood Co., Lim., McKeesport, Pa.

Ironwork, Ornamental.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Maat, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.

Keys.

Wollensak, J. F., Chicago, Ill.

Ladles.

Detroit Fdy. Equipment Co., Detroit, Mich.

Lamp Stoves.

Glazier Stove Co., Chelsea, Mich.

Lanterns.

Ohio Lantern Co., Tiffin, Ohio.
Steam Gauge & Lantern Co., Syracuse, N. Y.

Lathes.

Draper Machine Tool Co., Worcester, Mass.
Johnson, Israel H., Jr. & Co., Philadelphia, Pa.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Lathing, Wire.

Clinton Wire Cloth Co., Clinton, Mass.
N.

Machinery.

Am. Tool Works, Cleveland, Ohio.
 Barnes, W. F. & John, Rockford, Ill.
 Bennett, Hiles & Co., Philadelphia, Pa.
 Bigelow, O. E., 45 Dey, N. Y.
 Signal & Keeler Mfg. Co., St. Louis.
 Birmingham Iron Foundry, Birmingham, Conn.
 Bliss, E. W. Co., Brooklyn, N. Y.
 Bogert, Jno. L., Flushing, N. Y.
 Briggs, Marvin, 12 Broadway, N. Y.
 Carlin's Sons, Thos., Allegheny, Pa.
 Cincinnati Milling Mch. Co., Cincinnati, Ohio.
 Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
 Coulter & McKenzie Mch. Co., Bridgeport, Conn.
 Crutcher, D. B., Providence, R. I.
 Detrick & Harvey Mch. Co., Baltimore, Md.
 Fitchburg Mch. Works, Fitchburg, Mass.
 Garvin Mch. Co., Laight & Canal Sts.
 Gould & Eberhardt, Newark, N. J.
 Hamilton Mch. Tool Co., Hamilton, O.
 Harrington, E. Son & Co., Phila. Pa.
 Henderson, A. L., Wilmington, Del.
 Hendy Mch. Co., Hartford, Conn.
 Hendy Mch. Tool Wks., Richmond, Ind.
 Hill, Clarke & Co., Boston, Mass.
 Johnson, Israel H., Jr., & Co., Phila.
 Jones & Lamson Mch. Co., Springfield, Vt.
 Lodge & Shipley Mch. Tool Works, Cincinnati, O.
 Lovegrove & Co., Philadelphia, Pa.
 McCabe, J. J., 68 Cortlandt, N. Y.
 Machinists Supply Co., Rochester, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Conn.
 National Machinery Co., Lima, Ohio.
 Searles Mch. Tool Works, 222 N. J. New Haven Mfg. Co., New Haven, Conn.
 New York Mach. Depot, N. Y.
 Niles Tool Wks., 138 Liberty St., N. Y.
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
 Place, Geo., 120 Broadway, N. Y.
 Poole, Robt. & Son Co., Baltimore, Md.
 Powell Planer Co., Worcester, Mass.
 Pratt & Whitney Co., Hartford, Conn.
 Prentiss Tool & Supply Co., N. Y.
 Scranton Supply & Mch. Co., Scranton, Pa.
 Sellers, Wm. & Co., Phila.
 Seyfert's Sons L. F., Philadelphia, Pa.
 Steptoe, J. & Co., Cincinnati, O.
 Stow Flexible Shaft Co., Ltd., Phila.
 Toomey, Frank, Philadelphia, Pa.
 Wetherill, Robert & Co., Chester, Pa.
 Wilson, W. A., Rochester, N. Y.

Machinery for Hardware Manufacture.

Adt, Jno. & Son, New Haven, Conn.

Machine Knives.

Loring Coes & Co., Worcester, Mass.

Machine Screws.

New Britain Hdw. Mfg. Co., New Britain, Conn.

Machine Tools.—See Machinery.**Machine Work.**

Fapping, J., 58th St., & 11th Ave., N. Y. City.

Machinists' Scales.

Coffin & Leighton, Syracuse, N. Y.
 Starrett L. S., Athol, Mass.

Machinists' Tools and Supplies.

King, J. M. & Co., Waterford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.

Mallets.

N. Y. Mallet & Handle Works, N. Y.

Manufacturing Sites.

Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.

Measuring Tapes.

Keuffel & Esser Co., 127 Fulton St., N. Y.
 Lufkin Rule Co., Saginaw, Mich.

Meat Cutters.

Enterprise Mfg. Co., Philadelphia, Pa.

Mechanical Instruction.

Correspondence School of Mechanics, Scranton, Pa.

Metals.

Fearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
 Naylor & Co., 45 Wall, N. Y.

Metal Brokers.

American Metal Co., N. Y.

Metalurgists.

Britton, J. Blodgett, Phila.

Milling Machines.

Cin. Milling Mch. Co., Cincinnati, Ohio.

Milling Knives.

Palmer Hdw. Mfg. Co., Troy, N. Y.

Miner Lamps.

Darby, Edw. & Sons, Phila. Pa.
 Leonard, B. E., Scranton, Pa.

Mining Screens.

Harrington & King Perforating Co., Chicago, Ill.

Mirrors.

Rice, C. F., Chicago, Ill.

Molding Sand.

Obermayer, S. Co., Cincinnati, O.
 Paxson, J. W. & Co., Phila.

Motors, Water and Electric.

O. & C. Electric Co., 402 and 404 Greenwich St., N. Y.

Motors, Water and Electric.

Dallett, Thos. H. & Co., Phila., Pa.

Wall Machinery.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

Walls (Cut) and Spikes.

Borden & Lovell, 70 West, N. Y.
 Cumberland Nail & Iron Co., Phila.
 Oxford Iron Co., 81 Washington.
 Pottstown Iron Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.

Nail Yokes.

Johnson, S. C., Racine, Wis.

Nickel Platers' Supplies.

Hanson & Van Winkle Co., Newark, N. J.
 Zucker & Levett Chemical Company, 10 to 14 Grand St., N. Y.

Novelty Shapes, Rollers of.

Bowland, William & Harvey, Frankford, Philadelphia

Novelty Manufacturers.

Franklin, H. H. Mfg., Syracuse, N. Y.

Nut Machines.

Dunham Nut Mch. Co., Unionville, O.

Nuts, Bolts, &c., Makers of.

American Bolt Co., Lowell, Mass.
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Mc Carmel Bolt Co., Mt. Carmel, Conn.
 Port Chester Bolt and Nut Co., Chester, N. Y.
 Russell, Burdall & Ward, Port Chester, N. Y.
 Sternbergh, J. H. & Son, Reading, Pa.
 Wilson, J. Fred., Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R. I.

Oil Cans and Lubricators.

Sherwood Mfg. Co., Buffalo, N. Y.

Oilers.

Wilmet & Hobbs Mfg. Co., Bridgeport, Conn.

Oil Stones.

Pike Mfg. Co., Pike Station, N. H.

Oil Stoves.

Glazier Stove Co., Chelsea, Mich.

Ores.

Wister, Francis, Philadelphia, Pa.

Px Shoes.

Scranton Forging Co., Scranton, Pa.

Packing.

Billington, Jas. H. & Co., Phila. Pa.
 Morrison, Robt., St. Louis, Mo.
 N. Y. Belting & Packing Co. Ltd., N. Y.

Paddocks.

Ames Sword Co., Chicopee, Mass.

Fraine, E. T., Lancaster, Pa.

Hillebrand & Wolf, Phila. Pa.

Miller Lock Co., Philadelphia, Pa.

Paint.

Dixon, Jos. Crucible Co., Jersey City, N. J.

Paint Burners.

Dangler Stove & Mfg. Co., Cleveland, O.

Paint Cans.

Wilmet & Hobbs Mfg. Co., Bridgeport, Conn.

Patent Solicitors.

Henson & Rowson, Phila. & Washgton.

Jenns, H. W. T., Washington, D. C.

Stocking, E. B., Washington, D. C.

Perforated Metal.

Clinton Wire Cloth Co., Clinton, Mass.

Harrington & King Perforating Co., Chicago, Ill.

Hendrick Mfg. Co., Ltd., Carbondale, Pa.

Phosphor Bronze.

Phosphor Bronze Smelting Co., Limited, 512 Arch, Philadelphia.

Phosphor Tin.

Crescent Phosphorized Metal Co., Philadelphia, Pa.

Crosby Steam Gate & Valve Co., Boston, Mass.

Haik & Naumann, 516 Pearl, N. Y.

Picks and Mattecks.

Pumph, Fayette K., Philadelphia, Pa.

Pig Iron.

Houston, C. B. & Co., Philadelphia, Pa.

Montour Iron & Steel Co., Danville, Pa.

Naylor & Co., 45 Wall, N. Y.

Pickands, Brown & Co., Chicago, Ill.

Pilling & Crane, Philadelphia, Pa.

Samuel, Frank, Philadelphia, Pa.

Pig Iron Storage.

Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.

Pile Drivers.

Vulcan Iron Wks., Chicago, Ill.

Pipe Bent.

National Pipe Bending Co., New Haven

Pipe Cutting and Threading Machines.

Signal & Keeler Mfg. Co., St. Louis, Mo.

Merrill Mfg. Co., Toledo, O.

Fancoast Henry B. & Co., Philadelphia.

Saunders's Sons, D., Yonkers, N. Y.

Pipe Grips.

Prentiss Vise Co., 44 Barclay, N. Y.

Pipes, Fittings, &c., Makers of.

McNab & Harlan Mfg. Co., N. Y.

Pipe, Water and Gas. Makers of.

Cumberland Nail & Iron Co., Phila. Pa.

Donaldson Iron Co., Emmaus, Pa.

Riverside Iron Works, Wheeling, W. Va.

Wood, R. D. & Co., Philadelphia, Pa.

Plane Irons, Manufacturers of.

Buck Bros., Millbury, Mass.

Planes, Manufacturers of.

Stanley Rule & Level Co., N. Y.

Plate, Iron and Steel, Mfrs of.

Kea-Standard Iron & Steel Co., Bridgeport, Conn.

Plating, Nickel, Brass and Silver.

Wilmet & Hobbs Mfg. Co., Bridgeport, Conn.

Pokers and Lifters.

Troy Nickel Works, Troy, N. Y.

Polishing Machines.

Watson & Stillman, 204 E. 43d, N. Y.

Polishing Wheel.

La Massena, C. E. & Co., Newark, N. J.

Post Hole Diggers.

Buckeye Mfg. Co., Union City, Ind.

Wister, L. & R. Co., Philadelphia, Pa.

Presses, Dies, &c.

Barnum, E. T., Detroit, Mich.

Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.

N. J. Wire Cloth Co., Trenton, N. J.

"Silver Finish."

Tyler Wire Wks. Co., W. S., Cleveland, Mass.

Wright & Colton Wire Cloth Co., Worcester, Mass.

Power.

Laflin & Rand Powder Co., 29 Murray

New York Powder Co., 62 Liberty St., N. Y.

Power Hack Saws.

Millers Falls Co., 93 Reade St., N. Y.

Power Hammers.

Jelden Mach. Co., New Haven, Conn.

Olsen & Eisenhardt, Philadelphia.

Jenkins & Lincie, Belleroute, Pa.

Long & Alstatter Co., Hamilton, Ohio.

Presses, Dies, &c.

E. W. Bliss Co., Brooklyn, N. Y.

Crosby, G. A. & Co., Chicago, Ill.

Ferracute Mch. Co., Bridgeton, N. J.

Niagara Stamping & Tool Co., Buffalo, N. Y.

Stark Mch. & Tool Co., Buffalo, N. Y.

Stiles & Parker Press Co., Brooklyn, N. Y.

Waterbury Mch. Co., Waterbury, Conn.

Presses, Power, Makers of.

Bliss, E. W. Co., Brooklyn, N. Y.

Marshall, E. J. Mch. Co., Waterbury, Ct.

Merriman, A. H., Meriden.

Niagara Stamping and Tool Co., Buffalo, N. Y.

Robinson, J. M. & Co., Cincinnati, O.

Stark Mch. & Tool Co., Buffalo, N. Y.

Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Pulleys.

Keystone Clutch Mch. Wks., Phila., Pa.

Lave, J. H. & D. Co., Massillon, Ohio.

Reeves Pulley Co., Columbus, Ind.

Pulley Fixings.

Foley, J. W. & Co., Cincinnati, O.

Pulverizing Mill.

Bradley Fertilizer Co., Boston, Mass.

Pumping Machinery.

Coulter & McKenzie Mch. Co., Bridgeport, Conn.

Dodge Bros. Steam Pump Works, Indianapolis, Ind.

Hooker Colville Steam Pump Co., Chicago, Ill.

Lucas, C. O. & Co., Greenville, Ohio.

Lucas, J. H. & Co., Cincinnati, O.

Marlin, J. & Son, Jersey City, N. J.

Norwalk Iron Wks. Co., So. Norwalk, Conn.

Southward Fdy. & Mch. Co., Phila., Pa.

Valley Pump Wks., Easthampton Mass.

Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Pumps, Makers of.

Bellevue Pump Co., Bellevue, Iowa.

Deming Co., Salem, O.

Douglas, W. & B., Middletown, Conn.

East, Fogs & Co., Springfield, O.

Myers, F. E. & Bro., Ashland, O.

Punches and Shears, Hand and Power.

Bertsch & Co., Cambridge City, Ind.

E. W. Bliss Co., Brooklyn, N. Y.

Cockburn Barrow & Mch. Co., Jersey City, N. J.

Crosby, G. A. & Co., Chicago, Ill.

Ferracute Mch. Co., Bridgeton, N. J.

Henoer, A. L., Wilmington, Del.

Long & Alstatter Co., Hamilton, Ohio.

Niagara Stamping and Tool Co., Buffalo, N. Y.

Robinson, J. M. & Co., Cincinnati, O.

Stark Mch. & Tool Co., Buffalo, N. Y.

Stiles & Parker Press Co., Brooklyn, N. Y.

Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.

Watson & Stillman, 204 E. 43d, N. Y.

Rails, Old and New.

Perry, W. H. & Co., Providence, R. I.

Rat and Mouse Traps.

Burditt & Williams, Boston, Mass.

Estey, W. S., 65 Fulton, N. Y.

Rivley Mfg. Co., Unionville, Conn.

Sun Mfg. Co., Greenfield, O.

Razors.

Curley, J. & Bro., 6 Warren St., N. Y.

Electric Cutlery Co., 113 Chambers, N. Y.

J. & Torrey Razor Co., Worcester, Mass.

Riveting Machines.

Adt, Jno. & Sons, New Haven, Conn.

Rock Drills.

Sand Drill Co., 23 Park Place, N. Y.

Rolling Mill Machinery.

Birmingham Iron Fdry, Birmingham, Conn.

- Allentown Rolling Mill, Allentown, Pa.**
Lockhart Iron & Steel Co., Pittsburg, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.
Tudor Iron Works, St. Louis, Mo.
- Shears and Scissors.**
Acme Shear Co., Bridgeport, Conn.
Heinrichs, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**
Etna Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Chase Bros., Pittsburg, Pa.
Mahoning Valley Iron Co., Livingston, Ohio.
Moorehead-McCleane Co., Pittsburg, Pa.
Pierson & Co., 29 Broadway, N. Y.
Reilly, John W., Fort Hunter, P. O., Pa.
Singer, Nimick & Co., Ltd., Pittsburg, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia, Pa.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Metal Work.**
Clark & Cowles, Plainville, Conn.
- Sheet Zinc.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**
Koch, A. B. & Co., Peoria, Ill.
- Sinks.**
Douglas, W. & B., Middletown, Conn.
- Skates, Ice.**
Dame, Stoddard & Kendall, Boston, Mass.
Sickels, Sweet & Lyon, 35 Barclay St., N. Y.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**
Benley, M. C., Richmond, Ind.
Union Hardware Co., Torrington, Conn.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Smelting Works.**
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**
Clemenin Bros., Baltimore, Md.
- Speaking Tubes.**
Ostrander, W. R. & Co., 204 Fulton St., N. Y.
Wollensak, J. F., Chicago, Ill.
- Specialties, Pat. Articles.**
Konigslow, O., Cleveland, O.
- Speed Indicators.**
Church & Slight, 109 Fulton St., N. Y.
- Spelter.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Spoons and Forks.**
Boordman, L. & S., New Haddam, Conn.
Homes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.
Rogers & Hamilton Co., Waterbury, Conn.
- Sporting Goods.**
Hartley & Graham, 313-315 E'way, N. Y.
- Spring.**
American Spiral Spring Co., Pittsburg, Pa.
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Nourse, Fred. Co., 315 to 319 E. 22d St., N. Y.
Roland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt.
Tuck Mfg. Co., Brockton, Mass.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Spring Hinges.**
Bardley, J., 149 & 151 Baxter St., N. Y.
Fullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Co., 14 Warren St., N. Y.
- Sprinklers.**
Smith, Oliver A., Clarkston, Mich.
- Stamped Ware.**
Am. Stamping Co., 104 & 106 John St., New York
- Stamping Works.**
Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**
Cobb & Drew, Plymouth, Mass.
Titchener E. H. & Co., Binghamton, N. Y.
- Steam Gauges.**
Ashcroft Mfg. Co., 111 Liberty St., N. Y.
Bristols Mfg. Co., Waterbury, Conn.
- Steam Hammer, &c., Makers of.**
Dienelt & Eisenhardt, Philadelphia, Pa.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Trethewey Mfg. Co., Pittsburgh, Pa.
- Steam Heating.**
Webster Warren & Co., Camden, N. J.
- Steam Separators.**
Goubert Mfg. Co., 32 Cortland St. N. Y.
Harris & Safety Boiler Wks. Phila., Pa.
- Steel Balls.**
Grant Anti-Friction Ball Co., Fitchburg, Mass.
- Steel, Cold Rolled Strip.**
Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabets.**
Krogerud, W., 61 Fulton, N. Y.
- Steel Importers.**
Abbott, Wheelock & Co., N. Y. and London.
Hobson, Francis, Seaman & Co., 9 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y.
Whitney, A. B. & Co., B'way, N. Y.
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Steel (Mushet's Special).**
Jones, B. M. & Co., Boston.
- Steel Manufacturers.**
Etna-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Baker, Herman & Co., 103 Duane St., Carbon Steel Co., Pittsburg, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.
Elken & Co., Hazen, Germany.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambridge Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 9 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Kayser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Moorehead-McCleane Co., Pittsburg, Pa.
Ross, F. W., 83 John, N. Y.
Raylor & Co., 45 Wall, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Reilly, J. W., Fort Hunter, P. O., Pa.
Rowland, Wm. & Harvey, Frankford, Philadelphia.
Singer, Nimick & Co., Pittsburgh.
Stanley Works, New Britain, Conn.
Steel & Iron Improvement Co., Pittsburgh, Pa.
Taylor Iron & Steel Co., High Bridge, N. J.
Wordlaw, S. & C., Sheffield, Eng.
Wetherell Bros., 93 Liberty, N. Y.
Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel, Manufacturers' Agents.**
Barnes, C. K. & Co., Philadelphia, Pa.
Corning, Edw. & Co., 29 E'way, N. Y.
Fraser Co., 19 Warren St., New York.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierson & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambridge Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.
- Steel, Tools.**
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburg, Pa.
- Steel Wheels.**
Lillenberg, M. N., 150 Broadway, N. Y.
- Step Ladders.**
Bicycle Step Ladder Co., Chicago, Ill.
Croissant, M., Albany, N. Y.
- Stocks and Dies.**
Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Saunders & Sons, D., Yorkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Storage.**
Security Warehouse, E. St. Louis, Ill.
- Stove Linings.**
Ostrander Fire Brick Co., Troy, N. Y.
- Stove Pipe Thimbles.**
Cheney, S. & Son, Manlius, N. Y.
- Stove Trimmings.**
Troy Nickel Works, Troy, N. Y.
- Street Lamps.**
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Strops.**
Electric Cutlery Co., 113 Chambers, N. Y.
J. R. Torrey & Co., Worcester, Mass.
- Structural Iron Work.**
Berlin Iron Bridge Co., East Berlin, Conn.
Boston Bridge Wks., Boston, Mass.
Lindsay, Jas. G. & Co., Phila., Pa.
Wrought Iron Bridge Co., Canton, O.
- Sulphuric Acid.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Tacks, Brads, Staples, &c.**
Atlas Tack Corporation, Boston, Mass.
Clecin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Nat. Screw & Tack Co., Cleveland, O.
Phillips, E. & Sons, South Hanover, Plymouth Mills, Plymouth, Mass.
Traffant, W. E., Whitman, Mass.
- Taps and Dies.**
Futterfield & Co., Derby Line, Vt.
Carpenier, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**
Riehle Bros. Testing Mch. Co., Philadelphia.
- Testing Machines.**
Riehle Bros. Testing Mch. Co., Phila.
- Theoretical Hardware.**
Wollensak, J. F., Chicago, Ill.
- Thill Springs.**
Prost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.
- Time Record.**
Scattergood, H. W., Phila., Pa.
- Tinners' Hardware.**
Berger Bros., Philadelphia, Pa.
- Tinning Processes.**
Sands, Thomas, Nashua, N. H.
- Tin Plate Machinery.**
Lloyd Booth Co., Youngtown, Ohio.
- Tinware.**
Am. Stamping Co., 104 & 106 John St., N. Y.
- Tire Upsetters.**
Butts & Ordway, Boston, Mass.
- Toe Calks, Steel.**
Burke, P. F., Boston, Mass.
- Tool Chests.**
Am. Tool Co., 200 W. Houston St., N. Y.
- Tools.**
Brown, R. H. & Co., New Haven, Conn.
Fraser & Co., 19 Warren St., New York.
Mayhew, H. H. Co., Shelburne Falls, Mass.
Millers Falls Co., 98 Reads, N. Y.
Richardson, C. F. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers, Staret, L. S., Athol, Mass.
Tower & Lyon, 95 Chambers St., N. Y.
- Tools, Blacksmith and Wheelwrights.**
Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Plumb, Fayette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters'.**
Saunders' Sons, D., Yorkers, N. Y.
- Torches, Oil and Gasolene.**
Danisher Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.
- Transom Lifters.**
Wollensak, J. F., Chicago, Ill.
- Tree Protectors.**
McCallip Fence & Wire Wks., Columbus, Ohio.
- Trucks, Manufacturers of.**
Berger Bros., Philadelphia, Pa.
Blask & Lockport Block Co., Boston.
Clark, G. P., Windsor Locks, Conn.
Lansing Wheelbarrow Co., Lansing, Mich.
- Tubes, Seamless Drawn Copper.**
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.
- Tubes, Steel.**
Legg, John S. Son & Co., 4 Fletcher St., N. Y.
Mannesmann Tube Co., Ltd., Landore, England.
Shelby Steel Tube Co., Shelby, O.
- Tumbling Barrels.**
Henderson Bros., Waterbury, Conn.
- Turnbuckles.**
Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.**
Cleveland Twist Drill Co., Cleveland.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.**
Best, Fox & Co., Pittsburgh, Pa.
Chapman Valve Mfg. Co., Boston.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., 71 John, N. Y.
McNab & Harlin Mfg. Co., 56 John N. Y.
Mason Regulator Co., Boston, Mass.
- Ventilating Fans.**
Huyett & Smith Mfg. Co., Detroit, Mich.
- Ventilator Appliances.**
Howard & Morse, 45 Fulton, N. Y.
- Vise Jaws.**
Newark Mch. Tool Co., Newark, N. J.
- Vises.**
Capital Mch. Tool Co., Auburn, N. Y.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Millers Falls Co., 93 Reads St., N. Y.
Frontias Vise Co., 44 Barclay, N. Y.
Tower & Lyon, 95 Chambers St., N. Y.
Van Wagoner & Williams Co., 14 Warren St., N. Y.
- Wagon Jacks.**
Boston & Lockport Block Co., Boston, Mass.
and Lockport, N. Y.
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
- Washers.**
Haskell, Wm. H. Co., P. Ytucket, R. I.
Milton Mfg. Co., Milton, Pa.
Sternbergh, J. H. & Son, Reading, Pa.
- Washing Machines.**
Nett, W. H., Cowan Ind.
Stearns Mfg. Co., Connersville, Ind.
Wayne, A. Mfg. Co., Ft. Wayne, Ind.
- Water Meters.**
Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Water Wheels.**
Poole, Robt. & Son Co., Baltimore, Md.
- Wheelbarrows.**
Akron Tool Co., Akron, O.
Amer. Steel Scraper Co., Sidney, Ohio
- Wickburn Barrow & Mch. Co., Jersey City, N. J.**
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Lansing Wheelbarrow Co., Lansing, Mich.
S'dney Steel Scraper Co., Sidney, O.
Sweet Mfg. Co., Minneapolis, Minn.
- Whips.**
American Whip Co., Westfield, Mass.
- Window Cord, Makers of.**
Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.**
Amer. Spiral Spring Co., Pittsburg, Pa.
Consolidated Steel & Wire Co., St. Louis, Mo.
Gautier Steel Department of Cambridge Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Frontias, Geo. W. & Co., Holyoke, Mass.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester.
Wetherell Bros., 93 Liberty St., N. Y.
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**
Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Son, Philadelphia.
Estey, W. S., 65 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff, N. Y.
Howard & Morse, 45 Fulton, N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
Reliance Wire & Iron Wks., Milwaukee, Wis.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleveland.
- Wire Cutters.**
Cronk Hanger Co., Elmira, N. Y.
King, J. M. & Co., Watertown, N. Y.
- Wire Dies.**
McFarland, Wm., Trenton, N. J.
Newton & Shipman, 83 John, N. Y.
- Wire Door Mats.**
Hartman Mfg. Co., Elwood City, Pa.
Horrocks, Joshua, 45 Cliff St., N. Y.
- Wire Fences.—See Fencing, Iron and Wire.**
- Wire Goods, Manufacturers of.**
Darby, Edward & Sons, Phila.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
Ludlow-Saylor Wire Co., St. Louis.
Osawan Mills Co., Norwich, Conn.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Williamson, G. T. Wire Novelty Co., Newark, N. J.
- Wire Machinery.**
Am. Tool Wks., Cleveland, O.
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Morgan Construction Co., Worcester, Mass.
Waterbury Mch. Co., Waterbury, Conn.
- Wire Straightening and Cutting Machinery.**
Adt, John & Son, New Haven, Conn.
- Wire Nails.**
Consolidated Steel & Wire Co., St. Louis, Mo.
Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
Phillips, E. & Sons, South Hanover, Mass.
Phillips, Townsend & Co., Phila., Pa.
Plymouth Mills, Plymouth, Mass.
Salem Wire Nail Co., Salem, O.
Whitney, A. M. & Co., New York City
- Wire Rods, Steel.**
Consolidated Steel & Wire Co., St. Louis, Mo.
New Castle Wire Nail Co., New Castle, Pa.
Washburn & Moen Mfg. Co., Worcester, Mass.
Whitney, A. R. & Co., 17 E'way, N. Y.
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Wire Rope, Iron and Steel Makers.**
Broderick & Bascom Rope Co., St. Louis, Mo.
California Wire Works, San Francisco.
Essex Mfg. Co., Wilkesbarre, Pa.
A. Leschen & Sons, St. Louis.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester, Mass.
Williamsport Wire Rope Co., Williamsport, Pa.
- Wood-Working Machinery.**
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Wrenches, Manufacturers of.**
Billing, Spencer & Co., Hartford, Conn.
Capitol Mfg. Co., Chicago, Ill.
Central Iron & Steel Co., Brazil, Ind.
Coss Wrench Co., Worcester, Mass.
Gendron Iron Wheel Co., Toledo, O.
Keystone Mfg. Co., Buffalo, N. Y.
Tower & Lyon, 95 Chambers St., N. Y.
Trumont Mfg. Co., Roxbury, Mass.
Williams, J. H., Brooklyn, N. Y.
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Bicycle Step Ladder Co.....	86	Cleveland Novelty Co.....	79	Fitzsimons & Co.....	18	Indiana Wire Fence Co.....	4
Bigelow, C. R.....	57	Cleveland Stamping & Tool Co.....	30	Flagg, Stanley G. & Co.....	103	Ives, H. B. & Co.....	93
Signal & Keeler Mfg. Co.....	46	Cleveland Stone Co.....	54	Foley, J. W. & Co.....	51	Jacobus, W. H.....	100
Billings & Spencer Co.....	93	Cleveland Twist Drill Co.....	50	Forehand Arms Co.....	30	Jarecki Mfg. Co.....	44
Billington, J. H. & Co.....	34	Clinton Wire Cloth Co.....	8	Fraim, E. T.....	2 & 87	Jeffrey Mfg. Co.....	39
Bingham, W. Co.....	75	Cobb & Drew.....	13	Frankford Steel Co.....	20	Jenkins Bros.....	1
Birmingham Iron Foundry.....	23	Cockburn Barrow & Machine Co.....	72	Franklin, H. H. Mfg. Co.....	59	Jenkins & Lingle.....	43
Bissell, E. Son & Co.....	59	Coes, Loring & Co.....	94	Frasse Co.....	27	Jenner, H. W. T.....	6
Blake & Johnson.....	13	Coes Wrench Co.....	94	Frost Thill Spring Co.....	39	Jessop, Wm. & Sons.....	19
Bliss Co., E. W.....	49	Coffin & Leighton.....	44	Fulton Iron & Engine Works.....	52	Johns, H. W. Mfg. Co.....	16
Boardman, L. & Son.....	71	Colburn, A. M.....	48	Fulton Steam Boiler Wks & Foundry	41	Johnson, I. G. & Co.....	108
Bogert, John L.....	54	Colby Wringer Co.....	36	Gardner, Jas. & Son.....	26	Johnson, I. H., Jr., & Co.....	52
Boker, Hermann & Co.....	19	Coldwell Lawn Mower Co.....	97	Garrison, A., Foundry Co.....	25	Johnson, S. C.....	88
Boone, W. C. Mfg. Co.....	26	Colliau, Victor.....	29	Gartland Foundry Co.....	27	Jones, B. M. & Co.....	22
Booth, The Lloyd Co.....	27	Conroy, P. J. & Co.....	89	Garvin Machine Co.....	57	Jones, Jesse & Co.....	70
Borden & Lovell.....	7	Consolidated Steel & Wire Co.....	15	Gautier Steel Department.....	16	Jones & Lamson Machine Co.....	62
Borgner, Cyrus.....	27	Continental Iron Works.....	35	Gaylord, F. L. Co.....	3	Kayser, Ellison & Co.....	19
Boston Bridge Works.....	16	Copeland & Bacon.....	52	Gendron Iron Wheel Co.....	78	Keeley, Jerome & Co.....	18
Boston Gear Works.....	36	Corbin, P. & F.....	85	Gibbs Mfg. Co.....	96	Kennedy, Julian.....	28
Box, Alfred & Co.....	63	Corning, Edw. & Co.....	17	Gilbert & Bennett Mfg. Co.....	8	Keuffel & Esser Co.....	67
Boyce Rivet Co.....	108	Correspondence School of Mechanics	107	Glazier Stove Co.....	63	Keyless Lock Co.....	87
Bradlee & Co.....	17	Cotton, Barclay W. & Co.....	17	Gleason Tool Co.....	36	Keys, W. W. & R. M. Co.....	3
Bradley Fertilizer Co.....	39	Coulter & McKenzie Machine Co.....	44	Goodell Co.....	74	Keystone Clutch & Machine Works..	48
Brass Goods Mfg. Co.....	2	Covert Mfg. Co.....	89	Goubert Mfg. Co.....	39	Keystone Mfg. Co.....	65
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Britton, J. Blodgett.....	29	Crescent Steel Co.....	21	Green, A. H.....	93	Kohler, F. E. & Co.....	96
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Bronson Supply Co.....	81	Croissant, M.....	86	Gwinner Mfg. Co.....	68	Kreischer, B. & Sons.....	26
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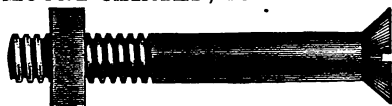
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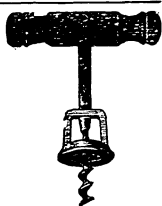
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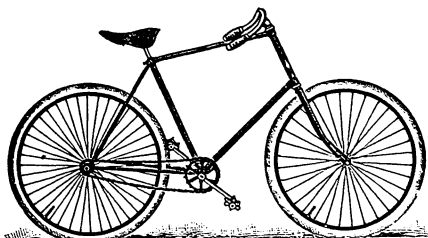
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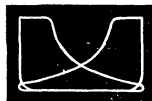
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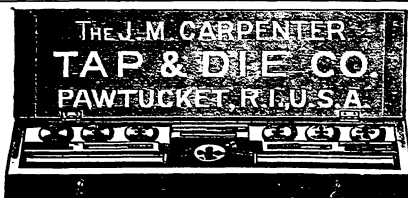
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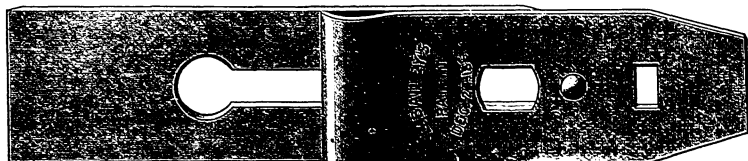
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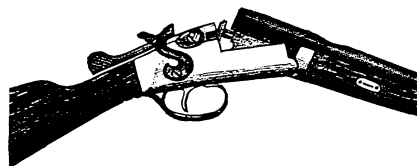
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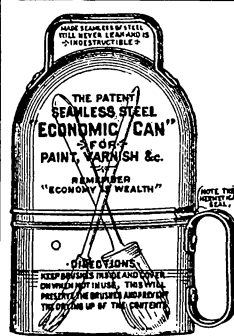


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THE IRON AGE

THURSDAY, OCTOBER 19, 1893.

The Heaviest Steel Casting for Marine Work.

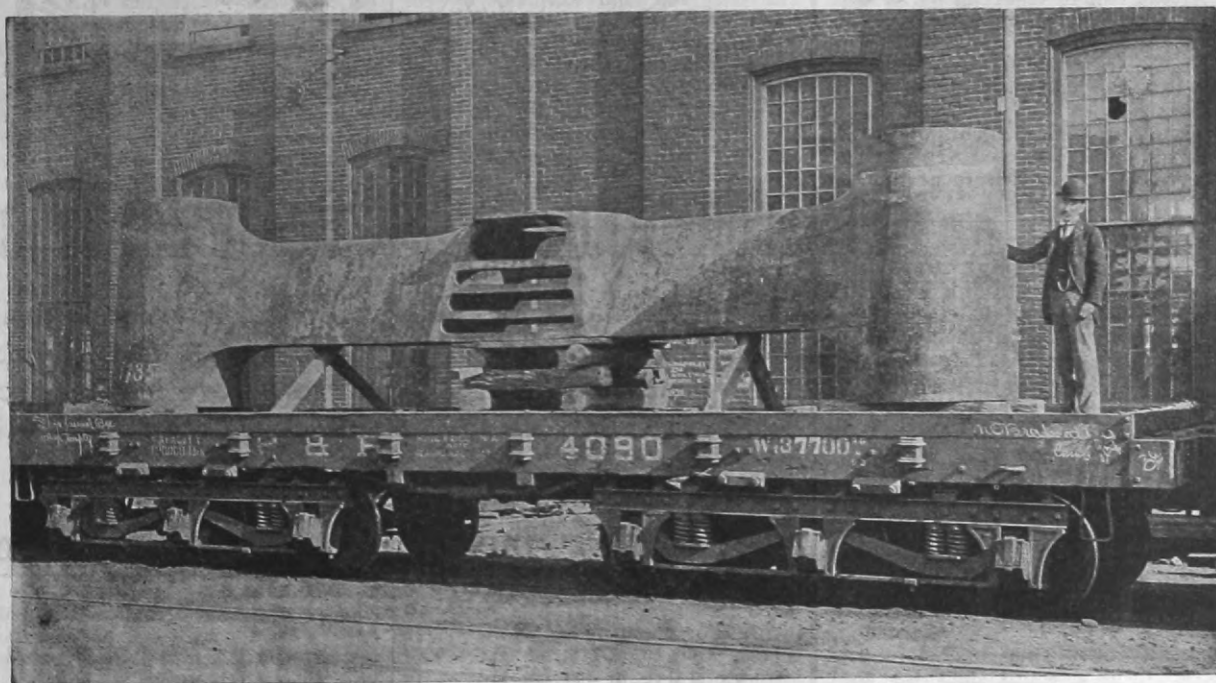
We reproduce from a photograph a view of the steel strut for the screw shafts of the first of the new Inman "American liners," being built at the works of the Cramps, at Philadelphia. It is the largest and heaviest casting yet made by the Standard Steel Casting Company, at Thurlow, Pa., and also the largest single casting yet used for marine work in this country. Its weight is 67,135 pounds, over 30 tons. The growth of this industry in America has been very rapid and satisfactory, and it is somewhat strange that while there now exists no difficulty in producing

especially useful where different degrees of vacuum are desired in each one of a series of chambers, as in the triple effect process of sugar refining and other processes where a certain vacuum is desirable.

The Walrand and Legenisel Process.

R. M. Daelen, a prominent German engineer, reports in *Stahl und Eisen* concerning the Walrand and Legenisel process of manufacturing Bessemer steel castings. The process in question has attracted considerable attention on the Continent of Europe, and is the outgrowth of an effort to enable foundries of moderate capacity to produce steel

that the success is complete. The addition of about 5 per cent. of fused ferrosilicon increases the temperature of the blow in a few minutes by 200° C., and makes it possible to carry on the elimination of what carbon there is still in the bath to a further point without introducing into the bath excessive quantities of oxygen. Therefore only a slight addition of ferromanganese is required for expelling the gases, which, besides, is facilitated by the high temperature. The process as invented by Walrand was developed in a practical way in the foundry of Legenisel Fils, at Paris, and a study of the operation led the Hagen Steel Works of Hagen, Westphalia, to put up two converters having a capacity each of



THE STEEL STRUT FOR THE SCREW SHAFTS OF THE NEW AMERICAN LINER.

the largest castings called for by any of the designers, it is still extremely difficult to successfully make the smaller ones, where by reason of coring and limited quantity of metal it is almost impossible to avoid the blow holes and spongy spots which render them so unreliable. This point must be overcome before the steel companies can hope to rival the productions of the iron foundries and tempt builders to further trials of steel for the small forms of castings where coring and thin parts exist.

A novelty in the way of a regulating device is the Mason vacuum valve, recently manufactured by the Mason Regulator Company of Boston, at the request of a large Canadian sugar refinery, which has now several in use. It is to the regulation of a vacuum what the reducing valve is to steam pressure, for by placing one of these valves in the exhaust pipe leading to the vacuum pump any desired amount of vacuum may be kept in the chamber by simply adjusting the valve. It is

castings with a small Bessemer plant. The baby Bessemer has been somewhat discredited by the unsuccessful experiments made abroad and in this country. It appears, however, that more recent modifications have removed some of the troubles incident to the earlier trials. The main obstacle has been thus far the low temperature toward the close of the blow. The recent modification consists in introducing into the bath substances whose rapid combustion creates high temperature. For the acid Bessemer ferrosilicon is employed, and for the basic Bessemer ferrophosphorus is used; still, a pronounced success could not be obtained as long as the practice was to add the ferrosilicon or ferrophosphorus during the boiling period, because the combustion of the silicon or phosphorus is delayed through the presence of a large quantity of carbonic oxide and because considerable heat is carried off by the large volume of gas. Recognizing this, Walrand of Paris decided to make the addition after the carbon had been blown out and thus create a second blow. Mr. Daelen states

1100 to 1500 pounds and producing per turn 4 to 5 tons of steel castings. Mr. Daelen states that with their experience in the manufacture of steel castings the Hagen works have succeeded in making with regularity hard and soft steel castings. Test pieces cut from the castings have shown a tensile strength of 59,700 to 71,100 pounds per square inch and an elongation of 25 and 22 per cent. respectively. Mr. Daelen claims that these Bessemer steel castings can be made much more cheaply than crucible steel castings, and that the baby Bessemer has certain advantages over the open hearth furnace in the manufacture of steel castings. The principal one is that the Bessemer converter may be started and stopped as readily as a cupola in a foundry, which cannot be done in the case of open hearth furnaces.

Massachusetts, according to the report of the State Highway Commissioners, loses \$5,000,000 annually on account of bad roads.

Iron and Steel at the World's Columbian Exposition—VII.

BY E. C. POTTER, CHICAGO.

The crowning glory of the iron and steel exhibits at the fair is that of the German firm of Fried. Krupp. This is as it should be, for while there may be corporations in the United States which consume more raw material and turn out a larger aggregate tonnage, yet for extent of plant, diversity of product, number of employees and excellence of material and workmanship the Krupp establishment easily leads the world. There probably never was a more extensive or costly display of iron and steel products assembled than is to be found in the Krupp pavilion. The word "iron" may as well be left out, for, with two or three exceptions, every article displayed is of steel, the exhibit thus becoming a valuable object lesson as to the completeness with which steel has displaced iron in the arts.

At the risk of repeating well-known data, I give a list of the component parts of these great works:

The main works at Essen comprise two Bessemer works with a total of 15 converters, four Siemens-Martin works, steel casting foundry, puddling works, welding shops, crucible steel foundry, iron foundry, projectile foundry, brass foundry, two annealing shops, hardening shop, crucible shop, cogging mill, rail mill, plate mill, mill for fish plates and spring steel, spring shop, hydraulic presses and armor plate mill, forge hammer shops, wheel forge, hearth forge, horseshoe forge, tire rolling mill, turning shop for sets of wheels on axles, boiler shop, shop for portable railway material, machine shop No. 1, file factory, repairing shops Nos. 1 to 4, railway repair shop; the ordnance department includes machine shops Nos. 2 to 5, gun shops Nos. 1 to 5, emery shop, boring shop, hoop shop, fuse shop, burnishing shop, gun reception department, gun carriage shed, gun carriage shops Nos. 1 and 2, limber shop, forge for gun shops, galvanizing and pressing shops, engravers' shop, nickel plating shop, laboratory work shop, tool store, projectile turnery, smith shop for shot turnery, lead melting shop, projectile reception department, gun store, packing shed, straw rope shop, proof butts, &c.; the testing department consists of test house and two chemical laboratories; the miscellaneous workshops include a carpenter shop, tinsmiths' shop, builders' joinery, furniture joiners' shop, cartwright's shop, painters' shop, saw mill, mortar shop, saddlers' shop, tailors' shop, steam producing plant, electric plant, gas works with four gasometers of 1,920,000 cubic feet total capacity, water works, fire brick and patent fuel works, brick kilns, coking plant, stone quarries, tile kiln, lithographic and photographic institute, including book-binding, forwarding department, conveyance of goods, shops for telegraph and telephones, fire brigade and life saving appliances, supply stores, &c. In addition to the Essen works this great firm own and operate 547 iron ore mines in Germany, 13 of which are underground workings; three coal mines; steel works at Annen; four iron works, viz.: Johannes works, at Duisburg; Hermanns works, at Neuwied; Mülholfner works, at Engers, and the Sayer works, at which latter are also a foundry and engine works; sundry iron ore mines at Bilbao and the North of Spain; the shooting range at Meppen

for artillery trials, with a maximum range of 15 miles; four seagoing steamers; sundry quarries, clay and sand pits; 3700 dwellings for workmen; infirmary and two barrack hospitals; workmen's barracks and dining rooms.

In the year 1890-91 the Essen works consumed 722,885 tons of coal and coke, the outlying works and steamers consuming in the same time 530,276 tons, making the total consumption for that year 1,253,161 tons, or about 4200 tons per working day. There are smelted daily about 1800 tons of the firm's iron ore. The consumption of water in that year was 9,230,000 c. m., or the same number of tons. This is distributed through the works and buildings through pipes and conduits aggregating 113 miles in length. The consumption of gas was 424,000,000 cubic feet, distributed through 144 miles of pipes. The electric light plant includes 50 miles of cable, 573 arc lamps and 1804 incandescent lamps. There are 30 miles of standard gauge and 21 miles of narrow gauge railway in the works, with 33 locomotives and 1217 cars. The telegraph and telephone system comprises 20 telegraph stations, with 35 instruments and 50 miles of wire; 200 telephone stations, with 202 instruments and 172 miles of connections. There are also 70 additional fire alarm stations. The supply stores comprise every variety of domestic supplies. The general census of 1892 shows total number of employees to be 25,301, of which 16,956 are employed at Essen and 8345 at the iron works and mines. The members of families aggregate 60,290, making a grand total of 85,591 souls not only dependent upon but actually cared for by this colossal establishment. Of these there are 16,588 school children. To the foregoing should also be added the works of Madgeburg Buckau, purchased during the past summer, but of which there are no data at hand.

It is, therefore, with a keen appreciation of the gigantic size and importance of this establishment that we enter their very extensive exhibit, housed in the striking pavilion on the lake shore south of the peristyle. The center of interest for the general public is, of course, the huge 125-ton gun. The history of this gun, its construction, its transportation from Essen to the fair, has been so often and so fully told one need only mention it in passing. A gun that is of more interest because of its tremendous power in proportion to its size is the 9.45-inch gun. Its great range is thus graphically illustrated: If this gun were mounted at Pre St. Didier, Switzerland, at an angle of elevation of 44° it could throw a projectile weighing 475 pounds over Mont Blanc, clearing the summit by 9000 feet and landing the shot in the neighborhood of Chamounix, 12½ miles distant. At a distance of 2187 yards this terrible engine of war can penetrate a wrought iron plate of a thickness of 23 inches. In addition to these two guns the firm also exhibit a 12-inch 61-ton gun for ships of war, an 11-inch 42-ton coast gun, an 8-inch 14-ton naval gun, a 6-inch quick firing naval gun, a 4.72-inch quick firing naval gun, a 3.43-inch quick firing naval gun, a 3-inch quick firing army gun, a 4-inch siege gun, a 9.45-inch siege mortar, a 3-inch portable mortar, a 3-inch field gun, a 2.4 inch boat gun, a 3-inch mountain gun and a 1.46-inch bush gun. Nearly all of these have their mountings complete, and all sizes and kinds of projectiles are shown. There is also a most complete and comprehensive display of

armor plate of various thicknesses, in most of which the effects of shot are shown.

But the steel manufacturer turns with more interest to those articles devoted to the peaceful pursuits and in which the firm of Krupp are no less famous. There are few railroads in America that are not familiar with Krupp tires. These are here shown in great profusion together with cast steel wheel centers, some of which have been subjected to remarkable distortion. The steel forgings include a crank shaft for an Atlantic express steamer, with thrust bearing, cranks, &c., complete, of a total length of 90 feet and weighing 103 tons. The four bladed screw attached to it is of cast steel and weighs 26 tons. A shaft of 12 inches in diameter and 82 feet long was forged by hydraulic press from a block of crucible steel 9 feet long and 4 feet in diameter, and subsequently bored out through its entire length to a diameter of 4.32 inches. A pinion for an armor plate mill of forged steel 3.6 feet width of face, 5.24 feet pitch diameter, with helical teeth milled out of the solid. There are also numerous examples of locomotive forged crank shafts, crank pins, piston rods, pump rods, &c. Among the cast steel articles the most noticeable are a ram stem and a stern post and rudder frame for a ship of war. The stem was molded in three parts, the heaviest weighing 15 tons, the total being 23 tons. The stern post and rudder frame were each molded in one piece, the former weighing 12.6 tons, the latter 11 tons. A bed plate for a cruiser engine, weighing 6 tons. An American consolidated locomotive frame cast in one piece, weighing 1.47 tons.

But the one piece in the whole exhibit which would impress a metallurgical engineer as being the most remarkable and as displaying the highest skill and workmanship is a train of gears for Krupp's own armor plate mill. This consists of two gears, one of 4.14 feet diameter, the other of 13.75 feet diameter, both of 3.28 feet face. Both are cast of crucible steel, the smaller one weighing 5 tons, the larger 20 tons. The smaller has 20 helical teeth, the larger 71 helical teeth of 7.12 inch pitch. The difficult nature of the castings, the material from which they are poured, the accuracy of the work and the smoothness of the finish are such as to excite the highest admiration.

The rolled steel articles include, in addition to the armor plate, a plate for a hydraulic bending press 11.15 feet long, 10 feet wide and 3.28 inches thick, weighing 73.81 tons; a boiler plate of Siemens-Martin steel, 65.5 feet long, 10.82 feet wide and 1.26 inch thick, weighing 16 tons; a boiler head 12.79 feet diameter and 1.5 inches thick, weighing 3.38 tons. These two last show the enormous capacity of Krupp's plate mill. Articles of pressed steel are in great number and variety. They include railway bogie trucks, locomotive domes, gun carriage walls, parts of limbers, ammunition wagons, &c., projectile shells, cream separators, balls for ball bearings and a very large number of die forged articles.

Among the miscellaneous articles shown not the least interesting is a pair of hoisting shears capable of lifting 83 tons, specially designed for handling gun barrels and used for placing in position the guns in this pavilion. There are also shown special designs of small hand and power rolling mills for rolling and polishing precious metals, tinsel, &c., and for use in mints.

The pavilion itself is handsomely

decorated with views and maps of the firm's works and properties. An interesting feature is the model of the very modest ancestral home of the Krupp family, the original of which is still preserved in the midst of the great works which in the course of years have grown up around it. There is also a model of the monument, one-twentieth of the actual size, erected by voluntary contributions of the employees to the memory of the late Alfred Krupp.

One can devote hours of examination and study to this most elaborate and comprehensive exhibit, which, together with the superb display of the Gebrueder Stumm in the Mining Building easily wins for the German Empire the first place in the iron and steel industries at the World's Columbian Exposition.

English exchanges record the disappearance of an interesting and famous

The Construction of Steamboats Navigating the Western Waters of the United States—I.*

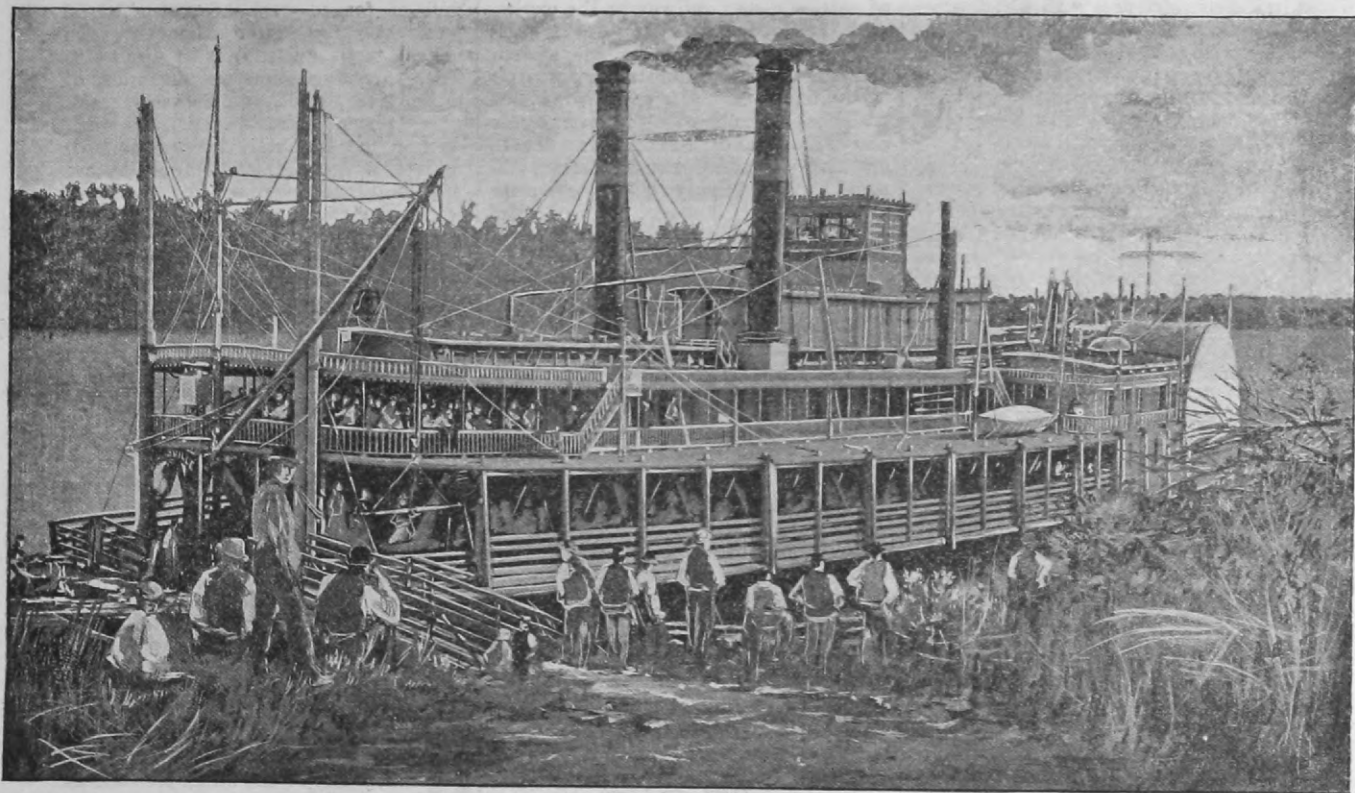
BY JOHN M. SWEENEY, WHEELING, W. VA.

It is perhaps unfortunate that it cannot be definitely settled when was the date of the first attempt of navigation of boats propelled by steam.

In a work, published some 40 years since in Spain, of original papers relating to the voyage of Columbus, preserved in the royal archives at Samancas, and those of the Secretary of War of Spain, in 1543, it is stated that Belasco de Garay, a sea captain, exhibited to Charles V, in the year 1543, an engine by which the largest vessels could be propelled even in a calm sea without oars or sails. The emperor de-

by some discredited, as the date is 54 years before the birth of the Marquis of Worcester, who is given by history the credit of being the inventor of the steam engine. It might be said in rebuttal that the incident just quoted of "De Garay's" experiment possibly came in some way to the Marquis's notice, and that he proceeded, after the manner of all inventors, to improve upon it. There is also a fact in history as to an early steamboat that might justify the belief that both Fitch and Fulton were not entirely original in their idea of a boat propelled by machinery moved by steam, presuming even that De Garay's exhibition in 1543 had not accidentally come to their knowledge.

A treatise was printed in London in 1737 describing a machine invented by Jonathan Hulls for carrying vessels against wind and tide, for which George II granted a patent for 14 years. A drawing is attached to the treatise show-



S.S. FLEETWOOD.

old landmark in the demolition of the Fazeley street rolling mills of Clifford & Co. of Birmingham. The old building was erected in 1737, and was a few years later acquired by a couple of Birmingham metal rollers, who are said to have been the first in the trade to employ steam for driving power. There is still upon the premises of Clifford's mill an old engine, known as "Old Bess," with wooden beam, dating back to 1802, and the beam is apparently as perfect now as when erected.

New South Wales, Australia, is likely to have an iron and steel works. The announcement is made that important concessions and mineral rights have been acquired for the purpose, and a company is being formed to carry out the scheme. The Government of the colony have offered a premium for successful works of this description, and the new enterprise will start under fair auspices on property at Wallerawang, where coal, iron ore and limestone are said to be found in abundance.

cided that an experiment should be made, which was successfully attempted June 17, 1543, in the harbor of Barcelona. The experiment was on a ship of 209 tons called the "Trinity." Garay never publicly exposed the construction of his engine, but it was observed at the time of the experiment that it consisted of a large caldron of boiling water and a movable wheel attached to each side of the ship.

From this statement it would appear that De Garay not only originated the steam engine, but made at the same time its application in one of its most practical and beneficial forms, and at a single effort accomplished that which took the light and talent of several generations to invent and bring to practical shape.

This statement, although based on the archives of Spain and those of the Secretary of War of that kingdom, are

* From a paper read at the World's Engineering Congress before the Division of Marine and Naval Engineering and Naval Architecture.

ing a boat with a chimney smoking and a pair of wheels rigged over each side of the stern. From the stern of the boat a tow line passes to the foremast of a two decker, which the boat thus tows. This is evidently the first idea of a steam towboat. As this was a published treatise and there was a patent on record, public information of a steamboat must have circulated before the experiments of Fitch and Fulton, or Stevens or Livingston; and while similarity of ideas in inventions is not infrequent, absolute originality is difficult to establish.

It would seem from the following extract from a diary kept by James Kenny, a Quaker trader at Fort Pitt, in 1761, that the Western waters of the United States had originated some of the first germs of the ideas of steamboat propulsion. The extract is:

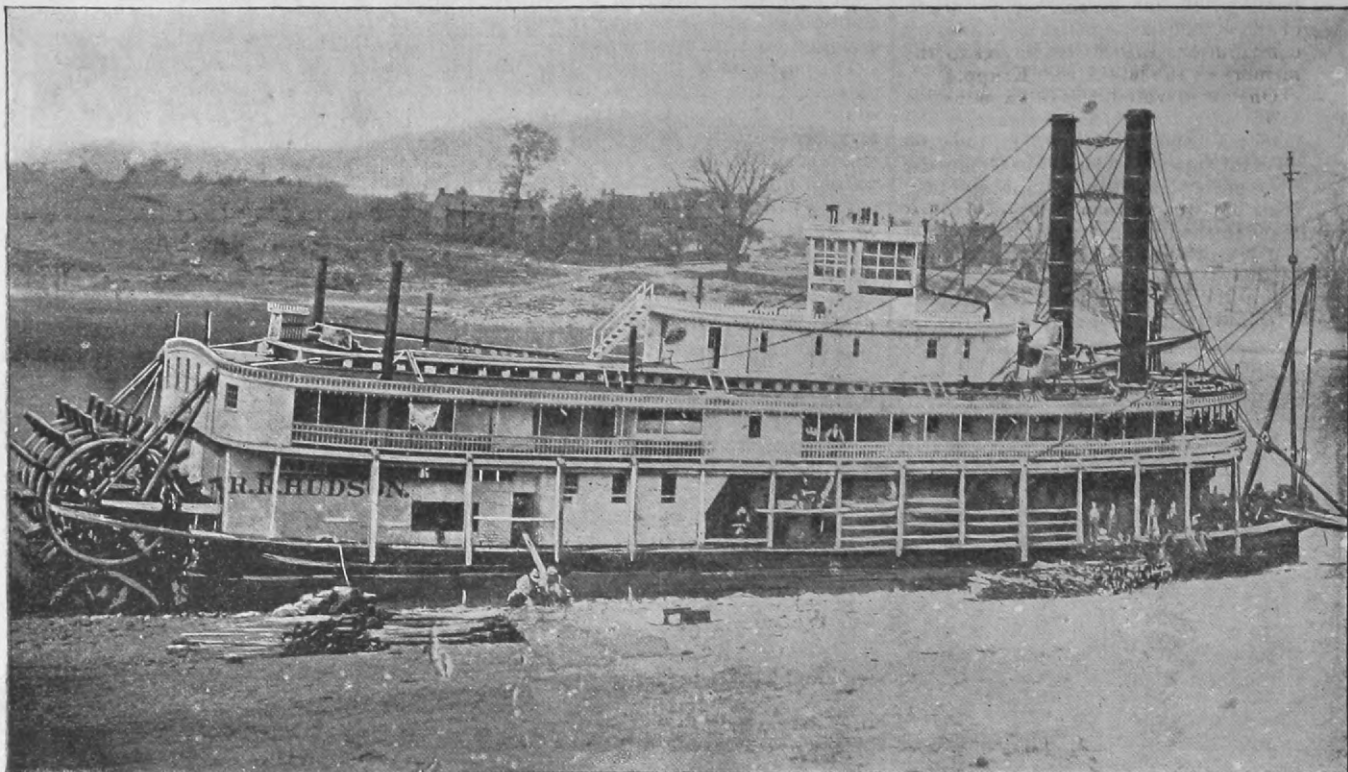
"1761, 4th mo., 4th: A young man called Wm. Ramsey has made two little boats, being square at the sterns and joined together at the sterns by a swivel, make the two in form of one boat, but

will turn around shorter than a boat of the same length, or raise with more safety in falls and in case of striking rocks. He has also made an engine with wheels that goes in a box, to be worked by one man, by sitting on the end of the

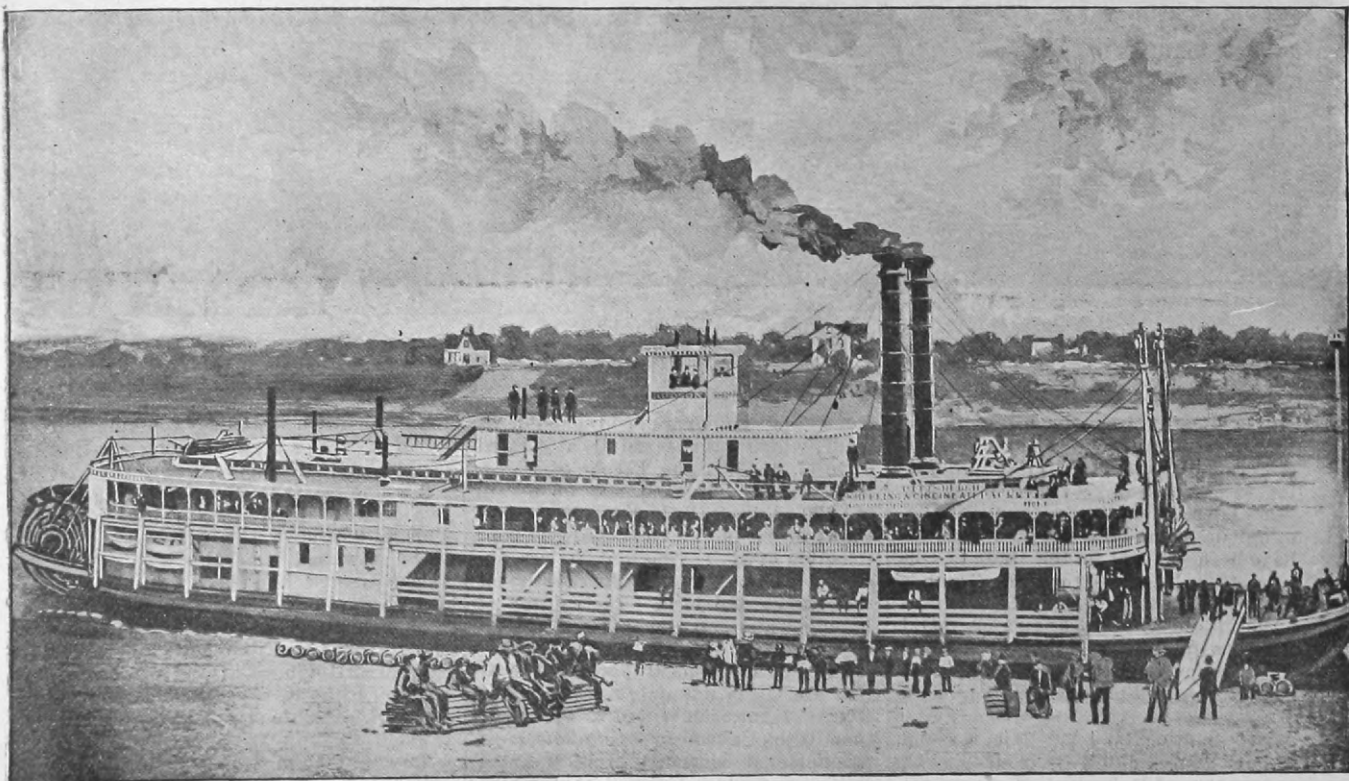
at the same time by lines like plow lines."

This was 25 years before James Ramsey of Berkeley County, Va., succeeded in propelling his flying boat, as it was called by the people, against the cur-

to which history, so far as recorded, gives full credit, seem to be preliminary to the practical results obtained by Fitch and Roosevelt, who, at Pittsburgh in 1810 and 1811, constructed a boat called the "New Orleans." This



S.S. R. R. HUDSON, 1865.



S.S. HUDSON, 1873.

box and tredding on treddles at bottom with his feet, set the wheels agoing which work scullers or short paddles fixed over the gunnels turning them around. The under ones always laying hold in the water will make the boat go as if two men rowed, and he can steer

rent of the Potomac at Shepardstown, by steam alone, at the rate of 4 or 5 miles an hour, and also 20 years before Fitch, in 1780, accidentally meeting Ramsey in Winchester, imparted to him his idea of propelling boats by steam.

After all, the preliminary experiments

boat was 138 feet length of keel; her cabin was in the hold and she had port holes, also a bowsprit 8 feet in length (painted sky blue), in ocean style; her cost was \$40,000. She was launched in March and descended the river to Natchez in December, at which point

she took in her first freight and passengers, and thence proceeded to New Orleans on the 24th of the same month. She continued to ply between New Orleans and Natchez until 1814, making the round trip in 10 days, conveying passengers at the rate of \$25 up and \$18 down. On her first year's business she cleared \$20,000 net. In the winter of 1814 she was snagged and lost at Baton Rouge.

Until 1814 there seems to have been no attempt to return boats from New Orleans to the head waters of the Ohio River.

The "Enterprise" was built at Brownsville, Pa., and made two trips to Louisville; later in the year she proceeded to New Orleans, carrying a cargo of ordnance, and she was for a time actively employed in transporting troops.

In 1817 this boat left New Orleans for Pittsburgh, and arrived at Louisville

minimum weight and maximum power, with all possible displacement of hull, per each unit of immersion, at all in keeping with anything like shape.

In boats designed for combined freight and passenger business the hulls are constructed with all the lightness in any way consistent with safety against falling to pieces, and the machinery must have small diameter of cylinder and boilers, and consequently must be designed for high steam pressure.

The character of the valve gear employed in the engines is particularly adapted to the class of boat being considered, because better fitted to the requirements of the service, the boats being very raftlike and limber; overloading at any point will distort their shapes; "tight on their chains" when without load, "slack on their chains" when loaded. So throughout the process of loading and unloading, one or the other effect constantly going on; these in turn per-

This article, therefore, will be confined entirely to the stern wheeler, as representing the most successful and recent practice.

For some time after the use of steam propelled craft on the Western waters began it was considered impracticable to bring the boats to a landing without first bringing them to anchor out in the stream; a line was then taken ashore in the yawl, and the boat hauled to the bank by the shore line. When the boat left the landing a reverse of this operation swung her to the anchor cable; the anchor was then lifted and the boat proceeded on her way.

The method of procedure has been very much improved. Now, in making a landing (and it must be understood that in this navigation boats land on the shore, and not against a dock of any kind, in the majority of cases), the boat is headed for the shore, the machinery stopped and reversed until the headway



S.S. HUDSON, 1886.

25 days out from New Orleans, which event the citizens of Louisville celebrated by a dinner to the captain.

In 1816 the "Washington," built at Wheeling, was the first boat to have her boilers placed above the deck.

In 1818 the "Independent," 50 tons, was constructed for the Yellowstone expedition, and was the first steamboat that ascended the Missouri River.

In 1819 the "Western Engineer" was the first boat to ascend to Council Bluffs, 650 miles above St. Louis.

The successful operation of these boats had, by this time, demonstrated what could be done, and from that time on the construction of boats for the navigation of these waters has been continuous.

The navigation of such streams as the Ohio and Mississippi rivers is a problem entirely distinct. On these Western waters only average results can be expected; boats must go, and make something near schedule time, whether the depth of the water is 80 inches or 30 feet, so that the first desideratum is

ceptibly vary the distances between the center of the main shaft and rock shaft. Now, the lever valve gear allows this variation without seriously affecting the timing of the valve movement; no other form of valve arrangement gives this very necessary quality of stretching.

Gradually, through the past years, side wheel boats have diminished in number and tonnage, and stern wheel boats have increased. At best, any of these wooden boats are perishable, and the vast difference in first cost and the cost of maintenance of the side wheeler over the "wheelbarrow" boat has determined investments in favor of the latter; and while, to outside appearance, the stern wheel boat of to-day is identical with that of 20 years ago, it is only so in that particular. The method of hull and joiner construction is much the same. Models have materially altered, and have carried with them, or perhaps been caused by, broad changes in the application of the rudder or steering arrangements.

is nearly checked, the remaining headway being sufficient to carry the boat to contact with the shore, and so the landing is accomplished. This practice is very much more expeditious than the old method, and has been brought about by the necessity of saving time in making landings, since the number of landings made by boats navigating these waters has vastly increased since their introduction. The writer has in mind a so-called trade between two points about 100 miles apart on the Ohio River. When the boats first entered the trade, some 40 years ago, they made a maximum number of landings, in a round trip between the points, not exceeding 35 or 40. At the present time boats in this same trade make never less than 150 landings, usually exceeding 200.

The banks of the Ohio River are fast being filled with railroads which parallel the stream. This development has increased the volume of business done in the valleys, and has increased the amount of water traffic, although largely changing its character.

Prior to the railroad development higher rates for service were charged by the boats than since, and the necessity existed for surplus boats of very light draft, which could be operated during the extreme low water in the river. When these boats were called into commission rates for both freight and passage were usually increased. At the present time the extreme low water boats are fast disappearing, because their navigation is attended with a considerable increase of expense over what might be called normal conditions, and the competing railroads prevent any increase of tariff charges by the low water boats over the regular normal charge.

One noteworthy labor saving device, which is now almost general on Western boats, is a method employed for handling the stage plank. Formerly, the stage plank consisted of rough boards about 18 inches wide, 3 inches thick, and 24 feet in length. These planks were pushed out by the deck hands, and in many instances—where by reason of flat shores the boats could not come in close to the water's edge—were rested upon a trestle set in the water, and a second section of plank reached from the trestle to the shore, a number of planks being placed side by side, making sufficient width to receive whatever freight there might be to handle.

This method of constructing a gangway was very slow and liable to be tripped or broken up by the waves of passing boats, or by the movement of the boat itself from which the gangway was constructed.

Of late years a gang plank has been adopted which is technically called a stage, varying in dimensions according to the size of the boat, but is usually about 8 feet wide and some 35 or 40 feet long. This stage is suspended in the middle, and is carried on a swinging crane which is attached near the forward end of the boat, and so arranged that the stage can be lifted through a tackle operated by a hoisting engine. Occasionally the stage is balanced by a weight, so that the use of the engine is dispensed with. On some of the boats two of these stages are used—one on either side near the forward end of the boat; but generally one stage is used for both sides, the derrick of the crane being in the center of the forward end of the boat.

Both of these methods will be understood by reference to the engravings of the steamers "Fleetwood" and the "R. R. Hudson," built in 1865; the "Hudson," built in 1878; and the third "Hudson," built in 1886. The boats are typical of the improvements of recent years, so far as the outward appearance is concerned, and represent a marked increase in dimension of hull, the "R. R. Hudson" being 180 feet long, 32 feet beam; the "Hudson," 200 feet long, 34 feet beam, and the last "Hudson" 235 feet long and 36 feet beam.

A story is related by some old boatmen that some time between 1820 and 1830 three men, who had been navigators of floating boats on the Ohio River, entered into a partnership for the purpose of having constructed a steamboat. The boat was to be 95 feet long. Shortly after the contracts were closed one of the parties to the enterprise proposed to increase the length of the boat to 110 feet. A meeting of the parties was held to consider the proposition, and two of them agreed that the length of the boat should be 100 feet; the third, not willing to consent to this increase in length, withdrew from the partnership, because

he did not believe so large a boat could be successfully navigated through the crooked channels of the Ohio River.

These early ideas seem very faulty and are hard to understand, when we consider that in the present day the same channel of the Ohio River is navigated by boats 350 feet long, and by boats with tows rigidly attached to them, the length of boat and tow reaching as high as 900 feet, and would rather lead one to the reflection that perhaps we, with our ideas of progress to-day, are as wide of the mark as was the man who refused to invest in a steamboat 100 feet long for the reasons given.

The advances made in construction and methods have been almost entirely in small things, but make an aggregate result of some importance. Much larger tonnage is propelled with greater speed. Some fuel economies have been made, and the cost of operation and maintenance largely reduced. The boats are more manageable. Not so very long ago it was a great exception to find a boat capable of turning around or of getting away from shore when strong winds were blowing. Now almost any of them go with slight delay.

Probably the most radical change from old forms is the disuse of wing rudders attached to skegs at the stern. For a long time the standard method for three rudder boats was two wing rudders and one balance rudder; when the number of rudders was increased, one or more balance rudders were added, but the wing rudders and the skeg you had always with you. The best practice of to-day discards the wing rudder entirely, using only balance rudders—never more than four, usually three, and occasionally two, depending on the beam and other dimensions of the hull. When the balance rudder was first employed, that portion of the blade projecting forward under the stern rake (when fitted close to the bottom, in the neutral position of the rudder) presented in its operation a constantly increasing space between the blade and bottom of the boat, as the rudder advanced to its extreme position on either helm. This space was objectionable, because likely to catch drift, and so foul the rudder; also, because it was thought the opening diminished the effectiveness of the rudder. In order best to relieve this trouble, the builders of the time spiked blocks of wood against the bottom plank, being careful to have the blocks thick enough, and then reduced them to a shape discovered by hanging a skeleton rudder in position and traveling it as they cut; this was technically called "building a bustle on." It did not last, however, very long—something like 15 years—until some one, lost to history, discovered it possible to form the frames or floors composing the stern to the desired cone shape, and dispense with the blocks of wood. This was a great stride, and soon became the rage, and was termed "building a bustle in." It is the practice to-day of those designers who think there can be no improvement.

Coeval with this practice was the use of a very short and steep rake to the stern of the boat, insisted on because it was popularly supposed to increase the bearing of the hull and induce a consequent lighter draft, as well as better to sustain the weight of the wheel machinery, which on the stern wheel boat was necessarily at the stern end. It is only in recent years that a probably better conception of the laws governing the propulsion of such boats has induced retirement of the wing rudders,

and a longer and more acute stern rake. The two are closely connected, because primarily the measure of the propulsion of the boat in either direction is the measure of the resistance of the body of water moved by the wheel in the opposite direction. Now, the wheel must be supplied with new water as fast or faster than it displaces it, so that, when the boat is being moved ahead, if the shape retards a free delivery of water to the wheel, a very bad application of power results.

In the bustle form of stern the appearance of the water when the boat is moving is very favorable, often smooth and clean, and without breaks between the wheel and stern rake, as well as around the outside of the hull; and many consider this surface condition to indicate proper shapes. However, a chip or block dropped into the water alongside of the boat, some 30 feet from the stern, will usually go under the boat in its effort to get to the wheel.

These boats depend entirely on rudder power to govern their movements in steering, and this can only be done by creating a current on the rudders; so that, when the wheel is used to move the boat astern, and at the same time it is desired to deflect the stern sideways, it is the water delivered from the wheel and passing under the boat which makes the force on the rudder. When the rake of the stern is steep the water from the wheel is banked against the end of the boat and reacts upon the rudder, causing the frequent deflection of the stern in the opposite direction to that desired.

In adopting designs for stern shapes, as shown, and making that shape the reverse of the bustle, it is still possible to preserve an approximate contact between the forward rudder blade top and the bottom of the boat. This is secured by discarding the old method of setting the rudder post and pintle square with the keel line, substituting a position at right angles to the plane presented by a rise of the rake at the station met by the under blade; so that the pintle and rudder stock and post pitch forward from a right line with the keel, and rudders other than the center one pitch also sidewise to meet a right line with the thwartship dead-rise of the bottom at the same point; therefore none of the pintles are in the same plane, and a ball joint is used on the tiller to connect the coupling bar common to all of them. A further guard against fouling the rudder action is in the opening left between the top of the rudder blade and the bottom of the hull, whereby any drift forcing in is soon relieved by the enlarging opening. The success of this plan has proved that the idea insisted on to have no current pass over the blade was a mistaken one.

The models for forward body or bow form are usually subject as much to the character of the craft as anything else. For a freight boat loading heavy weights on the fore-castle, a shape very full in harping adds increased bearing as the load increases, and at the same time allows sufficient cutting away in the first 2 feet to properly balance the boat when in light trim. Boats used exclusively for towing may be sharper in order to properly load with fuel carried almost exclusively amidships.

The best general shape seems to be that in which well-defined rising lines are found, so that the displacement is made downward rather than sidewise. This increases buoyancy when the hull is driven hard, and holds the head of

the boat up against burying; while the wall sided forward model seems to account for cases where the same hull, with larger driving power developed, actually showed a decreased speed.

Garvin Screw Machine and Universal Cutter and Tool Grinder.

The screw machine here illustrated is provided with geared friction head and power feed to the turret. The feed shaft extends along the front of the machine and is driven by a three-step cone, giving the necessary changes. The feed gears of the turret are also placed in front and are neatly incased to protect them from chips and dirt. The handle for operating the feed latch is conveniently placed on the side of this case. The turret slide is operated by the pilot wheel when desired, and has an automatic feed of 9 inches,

new and valuable features. The front bearing is extended, forming an out-board support for the end of the spindle, thus preventing any vibration. The spindle is hollow, and is provided with a rammer for removing the arbors. The rear end extends beyond the bearing and is arranged to carry emery wheels up to 8 inches diameter. A rest is also provided for grinding small drills, light tools, gear tooth cutters, &c. The guide finger is fixed in a yoke which clamps around the end of the front bearing, giving a wide range of adjustment and being quickly and easily set.

The surface grinding attachment is secured to the sliding carriage by a dovetailed swivel plate, and is securely held at any angle by a cam binder. The actuating mechanism is conveniently operated either from the end or side of the table, the travel being regulated by adjustable stops on the side. A vise is furnished for use in connec-

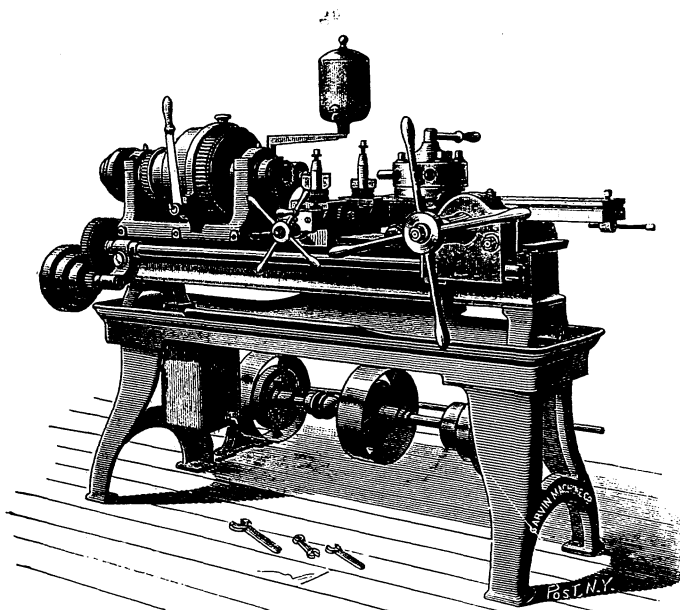
WORLD'S FAIR NOTES.

W. Osterlein

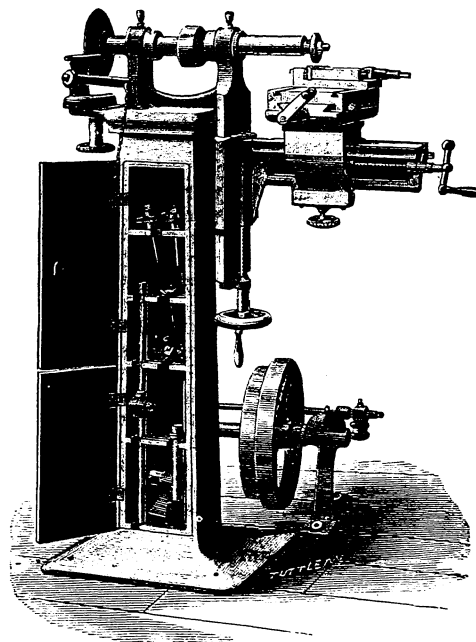
of Cincinnati exhibits friction clutches at Column J 28, Machinery Hall. Three sizes are shown, the largest being adapted to very heavy work and the others to light work. The shafting to which these clutches are connected is mounted on floor stands, but not supplied with power.

A. Falkenau

of Philadelphia exhibits lathes, grinding machinery, &c., at J 39, Machinery Hall. A 14 inch lathe is shown as a specimen of fine construction, embodying throughout the best materials and the highest class of workmanship. It is extra heavy with metal well distributed for strength and stiffness, has all parts subject to bruising wear case-



GARVIN SCREW MACHINE.



GARVIN UNIVERSAL CUTTER AND TOOL GRINDER.

which may be set to trip at any point in the travel by an adjustable stop on the slide. The cross slide is operated by a screw and pilot wheel and is fitted with two tool posts, each of which has an independent adjustment sideways by means of screw and knurled handwheel, insuring ease and accuracy in setting the tools. When desired the machine is furnished with wire feed or with plain cone, plain back gears, and without power feed to the turret. The principal dimensions are:

Largest diameter of cone, 12 inches; width of belt required for geared cone, 3 inches; for plain cone, 3½ inches; diameter of spindle, 3¼ inches; capacity of spindle with wire feed, 1½ inches; without wire feed, 2½ inches; swing over bed, 17 inches; length of bed, 6 feet; diameter of turret, 9 inches; number of holes in turret, 6; diameter of holes in turret, 1½ inches; length that can be milled, 9 inches; friction pulleys on countershaft, 14 x 4 inches; speed of countershaft, 150 revolutions; weight complete, 1900 pounds.

Universal Cutter and Tool Grinder.

This machine has been improved recently, and it now embodies several

tions with the sliding table, for holding flat work. The column base is fitted up as a cupboard with wood shelves for holding all the fixtures, wheels, &c. The machine will grind mills of 20 inches diameter and 6 inches face, and grind a surface of 8 x 10 inches.

The main dimensions are: Vertical adjustment of knee on column, 6½ inches; adjustment of sliding table in line with spindle, 6½ inches; travel of surfacing table, 10 inches; tight and loose pulleys on counter, 4½ x 2 inches; weight, 400 pounds.

Both these machines are made by the Garvin Machine Company of Lighthouse and Canal streets, New York.

The fire loss of the United States and Canada during September amounted to no less than \$10,508,700, which, although a decrease of \$2,714,000 from that of August, still shows a serious increase, amounting to \$2,628,900, over the loss of September, 1892. The total value of property destroyed by fire for the first nine months of the present year now reaches the enormous figures of \$120,832,700, or over 25 per cent. greater in the aggregate than those of the same period in 1892.

hardened, the gearing is accurately cut from the solid, the sliding surfaces are accurately scraped to a bearing, with no emery used in fitting, and with ordinary change gear it will cut all threads from 2 to 16 and even threads from 16 to 32. A 14-inch lathe is shown with a turret slide, the lathe having a 4-foot bed. The turret head is mounted on a slide, taking the place of the regular cross feed slide of the lathe. It is turned by hand, can be securely locked in its various positions and is furnished with stops to accurately size the work, while it can be locked in a central position for drilling, &c. The turret slide can readily be exchanged for a plain tool rest. The lathe can thus be used on a large class of work for which the more expensive automatic turret machines are not suited. The Taylor automatic tool grinder, shown in this exhibit, is a machine designed for grinding lathe and planer tools, as conducted in establishments in which one man or a boy does all the grinding, instead of each man leaving his machine to go to the grindstone when his tools are dull. The operation of this machine may be thus described: On an adjustable platen in front of the stone is a tool holder in

which the tool is fastened by a gear operated by a hand wheel. In the tool holder, directly over the tool to be ground, is placed a sheet steel former of the shape desired for the tool. The former rests against a hardened steel apron, attached to the head of the stone and made adjustable in and out. When the former bears against the apron the tool comes in contact with the stone. The former is held against the adjustable apron and the tool against the stone by means of a yoke and counterweight controlled by a treadle. Tools are thus ground to a uniform or standard shape. A universal and cutter grinder is also shown, which covers the whole field of accurate grinding of machine parts, milling and gear cutters, reamers, &c. A vertical belt pump, for boiler feeding, is shown in operation. This pump has a long plunger and a long connecting rod. The suction valve is furnished with a by-pass, so that the pump can be run continuously.

The Sherwood Mfg. Company

of Buffalo, N. Y., have an exhibit at K 25, Machinery Hall. Although occupying small space, they have used every available inch to such excellent advantage that it attracts more attention than some of the larger exhibits.

A small figure of Uncle Sam seated upon an iron pedestal works a Buffalo automatic cylinder oil pump with one hand and a Buffalo duplex flue scraper with the other, while with his feet he turns a handsomely nickel plated pedestal on which each alternate wheel is of lacquered brass. The pedestal holds glass oil and grease cups, hand oil pumps, lubricators and ball gauges, cocks, the entire pyramid being topped by a glass oil cup. On the railing which fronts the exhibit they have samples of the Sherwood and Buffalo automatic injectors. A 6-foot column of flue scrapers varying in size and branching into four arms at the top occupies a position of prominence. The Favorite flue blower is shown in various sizes, completing what is one of the most tasteful small displays of the entire machinery exhibit.

The Keasbey & Mattison Company

of Ambler, Pa., have an exhibit in Section D of the boiler house annex, Machinery Hall, where they have erected a neat and serviceable platform, around the outer edges of which showcases have been built containing specimens of their magnesia sectional steam pipe covering. It is composed of magnesia and asbestos and is intended for all manner of steam pipe, both high and low pressure, and also for boilers. It is further available for connections and fittings separately.

Beaman & Smith

of Providence, R. I., builders of milling, boring and special machinery, have on exhibition at Column K 47, Machinery Hall, a horizontal spindle milling machine, a heavy standard milling machine, floor and standard drilling and boring machines and a safety drill and tap holder. The milling and boring machines cover the leading types of machines of this character manufactured by the firm, and are shown in operation. The horizontal spindle milling machine is intended for long and heavy cuts, such as guide bars, connecting rods, key seating shafting, axles up to 10 inches diameter, &c. The heavy standard milling machine is intended for general machine shop use, but on larger work requiring larger cutters and taking deeper cuts than usually attempted on

milling machines of its type. The drilling and boring machines are of the horizontal type and are designed for drilling, boring and tapping a great variety of work. These machines are all of a high order of merit, but their safety drill and tap holder specially warrants a detailed description. The holder consists of a body with a taper shank to fit any machine having a revolving spindle, threaded on the outside and recessed to receive a socket held between two pieces of vulcanite fiber. A cap is screwed on over the socket and adjusted so that there is sufficient strength to drive the tap. A drill socket is held in the friction socket by a pin and is driven by feathers, the tap and its socket is held in the same manner. The taps being held loosely they cannot cut larger than themselves, and being driven by feathers, by feeding out and in themselves they cannot cut or strip the thread by careless hand feeding. On reaching the bottom of the hole the friction slips and the danger of breaking the tap is reduced to a minimum. The change from the drill to the tap socket can be instantly made without stopping the machine.

In the east gallery of the Mines and Mining Building are a number of exceedingly interesting exhibits, comprising graphite and its applications, abrasives, fuels, &c. All are more or less attractive, either by reason of the taste and ingenuity shown in the arrangement of the exhibits or else by the special character of the products displayed. An exhibit which combines all these characteristics is that of

The Joseph Dixon Crucible Company

of Jersey City, N. J. They have erected a very artistic facade of cherry and mahogany to mark the boundary of their space, which is richly furnished with fine carpet and handsome show cases, while numerous chairs have been provided for the hospitable reception of visitors. Arranged in the showcases are products of graphite in many forms, such as crucibles and silver and gold retorts, from No. 0000 up to No. 300, dippers, bowls, stirrers, nozzles, stoppers, electrical appliances, forms for incandescent lights, electrotypes' facings, foundry core wash, foundry facings, shot glazing, graphite lubricants, machinery oil, cylinder oil, inside and outside grease, dry lubricants, roof paint, boiler and smoke stack paint, yacht graphite, hatters' lead, pigment for paint, flake graphite, &c. These exhibits are in many instances arranged in glass jars, with richly enameled labels. One showcase contains specimens of graphite in special shapes, such as great bunches of pencil leads in all shapes and thicknesses, and resistants for electrical purposes in bars, coils, rings, rods, &c. On a mahogany table stands a Dixon crucible which was used at the American Bronze Works, Grand Crossing, Ill., in casting the solid silver statue of Justice for the Montana display in the Mines and Mining Building. The finest specimen of graphite ever mined, according to experts, is here exhibited, and an award has been granted the company on that ground. It weighs 269 pounds, and is said by mineralogists and chemists to be at least 98 per cent. pure. It was mined on the island of Ceylon. Numerous other specimens of graphite are shown which run up to almost 100 in fineness. The company's graphite is principally obtained from their own mine at Ticonderoga, N. Y. So little is known of graphite

by the general public that the company's representative in charge of the exhibit, John H. Baird, may be said to be delivering a perpetual lecture on this useful mineral to a stream of visitors. The special lead pencil display of the Jos. Dixon Company is located at Column F 98 in the northeast gallery of Manufactures Building. It occupies a small space, but the exhibit is nevertheless a very fine one. Samples of lead pencils in almost every conceivable shape and size are tastefully arranged on a four-sided frame in a handsome glass showcase. Returning to the Mines and Mining Building, another exhibit in the east gallery worthy of mention is that of

Robert J. Taylor & Son,

Nineteenth and Callowhill streets, Philadelphia, who show a great variety of crucibles and retorts for all purposes. These are arranged on a set of shelves, receding from very wide ones at the bottom to narrow ones at the top, to accommodate the different sizes of crucibles. A much larger display, however, in the same line is that of the

Phoenix Crucible Company

of Taunton, Mass., who have erected a great pyramid of shelves, crucibles of all sizes completely covering the four sides. Banners prominently displayed state that this is the oldest incorporated crucible manufacturing company in the United States. A large gilt phoenix surmounts this exhibit. In close proximity

The Carborundum Company

of Monongahela, Pa., make an interesting exhibit of a new abrasive. Carborundum is a recently invented material for this purpose due to the experiment of Edward G. Acheson. It is a compound of carbon and silicon, obtained through their fusion by an electric current. The material thus produced is crushed and sifted into different sizes. Very small but highly brilliant crystals are the result. Experiments of the most exacting character have been made with this material and its properties have been shown to be more nearly those of the diamond than of corundum. Its production thus far has been limited and for some time it was used in making very small grinding and cutting wheels, such as dentists' wheels, for which it proved to be superior to emery. It was also introduced in the form of powder for fine polishing, and notwithstanding its greater cost was shown to be able to compete with emery on account of its longer service. The production is now up to 200 pounds per day and it is being used for a wider range of grinding and polishing. Wheels of good size are being made for use in competition with emery wheels. A peculiar property of this abrasive is that it does not burr a tool or draw the temper, but can be used either wet or dry. This is explained on the theory that carborundum is an excellent and rapid conductor of heat. The manufacturers advise the use of a finer grain in carborundum than in emery. For instance, they suggest No. 70 in carborundum to use for the same work as that done by No. 60 in emery, the degrees of fineness being numbered in the same manner as emery. Next comes a remarkably interesting exhibit by the

Pittsburgh Crushed Steel Company, Limited,

of Pittsburgh, Pa., who display another artificial abrasive of a totally different character, which they style

crushed steel and steel emery, according to its degree of fineness. It is made from high grade and very high carbon crucible steel, each particle tempered to a proper degree to give it a cutting edge. The shape is irregular, so that no two grains are similar, and in wearing off one edge another is thereby produced until entirely worn away. The manufacturers claim that it will not pulverize, but must be worn out. It is assorted in all sizes from very coarse grains to a fine powder. So fine is the latter made that it is used for polishing the most expensive lenses. The coarser grains are used for solid core drilling, sawing, granite, onyx, blue-stone, marble, sandstone, limestone, &c., while the finer are used for rubbing stone, polishing glass, metals, brick, tile, &c. Beautiful specimens are shown of the work done with crushed steel in sawing, cutting and polishing stone. Among them are long, slender rods of marble, which would be very expensive if produced by methods ordinarily in vogue. Samples of the material are exhibited which have been in constant use for seven months and are still in condition for much more service in cutting and grinding. A truly magnificent display of abrasives is next made by

The Tanite Company

of Stroudsburg, Pa., which can be best described by quoting from a circular prepared by this company. They were requested by the exposition authorities to treat "abrasives" from an educational standpoint. The exhibit here illustrated and described is the result, and its compact character is due to the fact that the exhibit will be presented as a gift to the Smithsonian, the Chicago University, or some other suitable institution. While some of the articles were furnished by the Tanite Company many were contributed by liberal minded manufacturers.

Emery, being the most important abrasive, is illustrated fully. Emery ore is shown from Turkey, Greece and the United States. In one piece clear blue sapphire can be seen with the naked eye. On a platter of pure aluminum are shown sapphires, corundum and emery, with the explanation that alumina is the oxide of aluminum, and that the articles on the platter are largely composed of crystallized alumina, the sapphire being almost pure alumina. Emery is then shown in its successive stages—first as it comes from the crusher; then in the form of grain and flour; then as polish (powder, liquid and paste); and, lastly, in the shape of whetstones and solid emery wheels. Fragments of various classes of Tanite wheels are displayed to show the internal texture. There are bottles containing the dust gathered under Tanite wheels after the grinding of cast, malleable and wrought iron, and of brass and steel. These are for experimental examination with magnifying glass and magnet. "Petrified sparks" are an interesting feature. These are strangely shaped cones formed of the matter which fuses below an emery wheel when grinding under heavy pressure. The comparative products of the emery wheel, file and cold chisel are tabulated on a framed sheet, while the case contains pieces of cast iron and saw steel with the cuts made by file and wheel. The piece of saw plate demonstrates that in a given time the wheel did 126 times as much work as the file. In the case and on the ends of the stand are numerous parts of machines, all of which have been surfaced by the Newman emery plater. These

appear to be as true as if planed, and tabulation shows that this machine has taken a maximum cut $\frac{1}{4}$ inch deep, and has taken a $\frac{1}{16}$ inch cut over a surface of 100 square inches in six minutes and nine seconds. Its ordinary cut is from $\frac{1}{8}$ to $\frac{1}{16}$ inch.

Emery wheels are usually thought of in connection with metal grinding, but in this case are shown blanks for long combs and ladies' back combs, made of vulcanite, and other samples showing that the long comb has been edged and the back comb had the spaces between the teeth cut out with Tanite wheels. Glass guides from a silk spinning mill are also shown. In these guides the silken thread wears a tapering groove which eventually breaks the thread, and these grooves are ground out by the use of Tanite wheels.

As curious and instructive examples of abrasion, the parts of various machines used in the Tanite factory are shown, all testifying to unequal and destructive wear due to unequal stress and the friction of emery dust.

Corundum is shown from Ceylon and from our Southern States, in the form of mineral samples, and also in grain. To the latter samples, as also to some of the emery samples, are attached analyses showing the proportions of insoluble corundum, of dissolved alumina, &c. Samples of pumice stone and of rotten stone are contributed by T. Van Amringe of New York. Baeder, Adamson & Co., Philadelphia, show rock flint or quartz and rock crystal garnet in rock, in grain and on cloth. Norris & Brother, Baltimore, exhibit India spar. B. C. & R. A. Tilghman, Philadelphia show chilled iron shot. The Pittsburgh Crushed Steel Company show a full line of samples of their so-called steel emery, and the Carborundum Company show that material rough and finished. Millstone rock is shown by W. & F. Livingston and by Samuel Carey, both of New York. Wm. M. Kirby, Pittsburgh, shows grindstone rock, as do also J. Westby, Levick & Co., Sheffield; England. J. B. Hull, Stroudsburg, shows, in regular order, the materials used in rubbing down granite and marble. Scythe stones, rough and finished, are displayed in great variety by P. M. Peterson & Son, Porsgrund, Norway. The Pike Mfg. Company of New Hampshire also show a great variety of natural whetstones, &c. D. A. Richardson, Helena, Mont., contributes rough sapphires and A. W. & C. E. Tanner, Red Bluff, Mont., some fine specimens of garnet. Corundum is supplied to this exhibit by Ed. L. Hand & Co., Philadelphia, and by Geo. L. English & Co., New York. Among the curiosities of abrasion are the following: Leaves of the afeen plant, used to clean gourds after the manner of sandpaper, contributed by Bolding Bowser, U. S. Consul, Sierra Leone, Africa. Wood of Agave Polyacantha, used for razor strops, contributed by Wm. P. Pierce, U. S. Consul, Trinidad. Dutch rushes or scouring rush (*Equisetum Hyemale*) from Yorkshire, England, supplied by David Brodie, M.D., London, and rush for same purpose furnished by John Selwood, Stroudsburg, Pa. The epidermis of these plants is formed of silica and the rush is used to polish wood and metals. Shark skin is contributed by the Tanite Company. This is to be used in same way as emery cloth and sandpaper.

Samples of carbon or black diamond and also samples of clear or gem diamond, suitable for turning or dressing emery wheels, are shown by the Tanite

Company. The evolution of razors and table knives is shown in two series of samples, beginning in each case with the rough ingot or blank of steel, progressing through various stages of polish to the final bright finish.

An interesting series of photographs shows emery veins and mining processes in Westchester County, N. Y.

After showing how wide a range of materials and processes is covered by this compact and unique exhibit, we can close in no better way than by referring to two pictures: One of these seems to represent the tail of a comet, though what is really shown is the stream of fiery sparks streaming off from a Tanite emery wheel while engaged in grinding through a file. The other is a photographic reproduction of a picture in the Royal Gallery, Berlin. The photograph was contributed by Markt & Co., Hamburg, and the painting was by Gerard Ter Borch, who was born in Holland in 1617. This painting represents with much detail "The Grinder's Family," and depicts clearly the rough and primitive grinding processes then employed.

The many articles already mentioned form only a part of this exhibit; but enough has been said to show how much unexpected interest, even for the unlearned, may be found in an exhibit whose name suggests nothing but a dry, hard, technical study.

H. W. Johns Mfg. Company

of New York, Chicago, Boston, Philadelphia, Atlanta, Jersey City and London, have six exhibits of their specialties, owing to the variety of claims covered by their productions. In the Mines and Mining Building they have machinery in operation manufacturing asbestos fabrics, on the ground floor in the northeast corner of the building, Section Q. In the same building, in the northeast gallery, Section T, Column 11, they exhibit a collection of asbestos minerals from all parts of the world. In the Electricity Building, west gallery, Section U, they show insulating materials for electrical purposes, vulcabeston, &c. In Machinery Hall asbestos pipe and boiler coverings are in actual use. The feed pipes for 70 engines and about 50,000 feet of main steam supply pipes are covered with asbestos sectional coverings. In the great Manufactures Building paints are shown on the ground floor in the northwest part of the building, Section H, Block 1, while the general exhibit of the manufactures of the company is located in the gallery in the northeast corner, Section F. This last exhibit covers an enormous variety of asbestos goods, such as drop curtains for theaters, fire proof building paper, gaskets for pipe joints, pipe coverings, &c.

B. & S. Massey

of Openshaw, Manchester, England, exhibit in the British section of Machinery Hall, at Column K 6, several full sized steam hammers and some small working models of their hammers. One of the full sized hammers is a $\frac{1}{2}$ -hundredweight self acting and hand worked steam, with loose adjustable slides and overhung framing, the stop valve being controlled by a foot lever and hand lever at will. The slides are separate from the standards and made adjustable to take up wear. The trip or hammer head is accurately grooved and works between these guides, which also support it, taking the strain off the piston rod, especially when subjected to side thrusts. The anvil block is accurately turned to fit the bored out hole in the base plate, which is of importance in

preventing all lateral movement. It is provided with a strong key to prevent its turning round. It is fitted with a loose anvil top of best crucible steel, also a palette or hammer face of the same material. The loose top can be easily removed when more space is needed under the hammer, or it can be readily repaired or replaced when worn or broken. The hammer is so perfectly under control that it can be made to deliver long or short, quick or slow, heavy or light blows, instantly and without stopping. Another full sized tool is a 3 hundredweight special steam stamp, for stamping in dies. It has specially arranged gear for the purpose, and is also fitted with self-acting gear for forging, which can be thrown in or out of gear as desired, and patent loose adjustable slides and patent buffer arrangement complete, with massive base and tool holder. It is useful for dishing and hollow ware generally. The principle on which the slides are made is new and has just been patented. They are so constructed that the wear on the slides and tup can be taken up. Not being in one piece with the standards they can be readily replaced. The patent adjustable buffer limits the upward stroke of the piston to any required height, thus insuring a regular and even blow for different classes of work. When lowered for short strokes the buffer fills the upper part of the cylinder and prevents the steam from needlessly filling this space, which economizes the use of steam. The valve gear is simple and efficient. When being used for stamping, as the steam is turned on the tup instantly rises to the top of its lift and remains there until the hand lever is pressed, when it at once delivers its blow and rises, leaving the lower die clear for the removal of work. Three small models of steam hammers are shown worked by compressed air. They are made accurately to scale to represent different types of hammers. Photographs are shown of different styles of hammers, with specimens of actual forgings made.

Peter Wright & Sons

of Dudley, England, exhibit at Column K 6, in the British section, Machinery Hall, 112 samples of their famous "solid wrought" anvils, ranging from 30 pounds to 648 pounds, made after a patent process. It is claimed that they cannot be broken by ordinary usage. They have a grade of finish peculiar to the firm. Every anvil is tested by a member of the firm as to soundness, hardness of face, &c. The Government test of hardness is that a new second cut file shall just touch the face, and all these anvils must conform to it. All are made of forged scrap iron, and are forged under Massey's hammers. Thirteen vises are also shown made of fagoted scrap iron, BB iron and steel jaws. The worm and box are cut from the solid by a patent process. There are seven leg vises and six parallel vises. The leg vises range from 31 pounds and 3½ inch jaw to 209 pounds and 8-inch jaw; the parallel vises from 3½ to 8 inch jaws. These vises are peculiar in having a very long pin, so that when the jaws are spread to their full opening the screw on the end of the pin still fills the box. They are further stiffened and strengthened by a J-shaped slide under the pin, also made very long. The vises are shown attached to a long bench, while the anvils are displayed on a platform having several steps. The anvils include saw makers', farriers', plow makers' and the regular smiths' pat-

terns. Their total weight is a little under 20,000 pounds. This entire exhibit has been sold to Jones & Laughlins of Chicago.

The Electrical Forging Company

of Boston, Mass., make one of the most novel exhibits at the exposition. The operation of heating and working metals by electricity on the Burton system is shown on quite a comprehensive scale in Electricity Building, Section D, Space 2, in the northeast quarter of the building. Appliances for forging, welding, rolling, brazing and for rolling balls and taper pins are in regular operation. One of Merrill Bros.' large drop forges is used for the manufacture of miniature horseshoes, which are in eager demand by spectators for souvenirs. Everything is done by electricity, the machines being operated by an electric motor. A large electric heater with several metal holders is used for heating bars for forging, rolling and welding, also for welding tubes or pipes. This heater is so governed by a regulator or rheostat that pieces of different diameters and varying lengths are heated at the same time, the heater dividing its current automatically. Iron or steel or copper can be heated easily and in a remarkably short time. The holders for heating bars to be rolled into balls are located close to the rolling machine. There are four of these holders, so that the operator can be kept supplied with heated rods. The metal thus heated is not oxidized, and the most ignorant workman is in no danger of burning it. Experiments of many kinds were made in the presence of the writer to demonstrate the remarkable mildness of the heat thus applied. A striking peculiarity of the heated bars is that at a white heat the part of the metal not exposed to the electric current is quite cold within a very short distance of the heated portion. A portable heating apparatus is shown, which is adapted for use in heating rivets in the construction of buildings or in other isolated locations. A bucket containing water is connected with one pole of an electric current, which may be taken from an electric light, a trolley wire or other convenient source of electric energy. A pair of tongs is connected with the other pole. A piece of metal held by the tongs being dipped in the water the circuit is completed and the metal at once begins to heat. It will melt if kept in the water any length of time, the action being very rapid. A jacket of hydrogen, it is explained, is generated which envelops the metal and protects it from the action of the oxygen, so that the iron or steel is not injured by the heat as applied in this manner. A piece of steel held in the water until the end fused was found to be unburnt after it was allowed to cool. A medal and diploma have been awarded this exhibit "for originality, rapidity in placing and removing the metal to be heated and adjusting the heating devices to varying sizes, shapes and lengths, and for original and superior construction and apparatus."

The Pratt & Whitney Company's

exhibit occupies a very large space at Column J 44 and 45, Machinery Hall, comprising machine tools in operation and a great variety of small tools in showcases. There are eight large showcases, filled with beautifully finished tools that make machinists' eyes water. These comprise a

Set standard cylindrical size gauges,

plugs and templets, ¼ inch to 2 inches by sixteenths, in case.

U. S. standard thread gauges; M. C. B. standard limit gauges.

M. C. B. standard gauges for automatic couplers; standard drop forged caliper gauges; standard hardened mandrels.

Standard hand, shell, chucking and taper reamers.

Set Am. Ry. M. M. Assoc. wheel center and tire gauges.

Car wheel circumference gauges, M. C. B. standard.

Gear cutters, milling cutters, &c.

Taps, U. S. standard, dies, die stocks, boiler and stay bolt taps, punches, Kennedy and plain, and hand punching machines, hand shearing machines.

Counterbores, cutting off tools, threading and lathe tools and small tools of every description ordinarily required in modern machine shop equipment.

Sets of gauges are also shown in other cases, being kept under key to prevent them from being handled.

Milling machines are a prominent feature of the display of machine tools. Many kinds of work are now done by milling cutters of special form or special application very much more rapidly and accurately than by old methods.

Much interest is excited among visitors in a new plain chucking machine fitted with tools for brass cock and key manufacture.

The gun making machinery is a novelty to most people. Here are shown gun barrel drilling machine, gun barrel reaming machines, and gun barrel rifling machines. The operator of the gun barrel drilling machine can, without any particular effort of mechanical skill, drill a continuous hole through solid stock, and if conditions are what they should be there will be found little deviation from a straight central bore of uniform size. No particular apparatus is required for starting the drill, neither is any straightening required during the operation, and little or none until after the proof reaming. The machine is double and has a horizontal bed. The heads are at the end and have mounted in them independent spindles parallel to each other. On their inner ends are chucks for securing and rotating the barrels in the adjustable rests which support, guide and control the starting of the drills, which are secured in the sliding carriages. These are fed positively 38 inches by a screw having automatic stops. The screw has a variety of speeds through change gearing, in order to compensate for the different qualities of stock to be drilled. Two rotary pumps (one for each barrel) force oil, supplied from a tank placed underneath the machine, through a series of tubes into and through the drill. The oil lubricates the cutting lip and forces out the chips into the basin on top of the tank, where they are drained, and the strained oil returned to be pumped again. Rifle barrels 30 inches long, 0.3 inch bore, can be drilled (with each spindle) in 1½ hours; the same length, 0.76 inch bore, in 1½ hours.

The very accurate scales on which the machines of this company work cause many expressions of surprise and admiration from foreign engineers.

The company make a special exhibit, at another part of Machinery Hall, of their automatic grain weighing machine and bagging machine.

Geo. M. Bond is in charge of the exhibit.

The Illinois Iron & Bolt Company

of Carpentersville, Ill., make a fine exhibit of letter presses in the northeast corner of the gallery of the Manufactures Building, Column F 94. The collection comprises hand wheels, levers and double hand wheels for heavy work. Huge presses are shown for taking impressions of very large sheets. The large presses are handsomely decorated, and trimmed with nickel plate. There are a number of specimens of presses of the ordinary office size in a variety of styles and kinds of finish.

McIntosh, Seymour & Co.

of Auburn, N. Y., have in operation in Machinery Hall, running dynamos for the General Electric Company, a 1200 horse-power double tandem compound engine, which is receiving much commendation. This engine is equipped with a governor which is remarkably sensitive, quickly controlling the action of the engine on varying loads. The special features of the engine are that the main valves are of the piston type, with adjustable seats and auxiliary cut off valves driven by the governor; all valve gear is driven from detachable drag link shafts; copper heating coils in the receiver are fed from the high pressure cylinder steam jackets; water jackets are applied to guides and main bearings; ball and socket main bearings are provided with oil settling chambers and circulating pumps for continuous oiling. The dimensions of the engine are as follows: Diameter of high pressure cylinder, 18 inches; diameter of low pressure, 32 inches; stroke, 36 inches; speed, 112 revolutions per minute; steam pressure, 125 pounds condensing; main bearings, 24 inches long by 14 inches diameter; diameter of shaft between bearings, 16 inches; fly wheel, 16 feet in diameter and 78-inch face; weight of fly wheel, 62,000 pounds; total weight of engine, 250,000 pounds.

The Electric Traveling Crane,

built by the Yale & Towne Mfg. Company of Stamford, Conn., that did so much of the work of installing the exhibits in Machinery Hall and is now carrying passengers, has become as popular as a means of obtaining a bird's eye view of the hall as is the Ferris wheel for a general view. It has received an award from the John Boyd Thatcher commission. In addition this company have received individual awards on the locomotive crane in the Transportation Building, on the 10-ton pillar crane, the triplex block, the duplex block, the safety double lift hoists and the crabs and winches in Machinery Hall, every machine shown by the company thus receiving an award entirely on its own merits, the excellence of the company's products being thus emphasized and indorsed in the strongest manner possible within their power by the Board of Awards.

Hemenway & Browne, New York, exporters of American products to West Coast South American ports since 1829, have recently secured a contract to supply the Chilean Government with 12 locomotives and tenders. They were obliged to compete twice with leading European and American concerns, bidding the lowest both times. A year ago this house bid on 450 freight cars twice and were the lowest bidders in each case, but the local press objected so strongly to sending such an order out of the country, when native shops needed en-

couragement, that finally it was kept there. While most of the South American countries have for some time preferred such goods should be built in the United States, it is worthy of note that the volume is constantly increasing and this particular order will not only amount to about \$200,000 in American gold, but be the means of influencing a certain amount of contingent commerce. This rolling stock will be built by the Rogers Locomotive Works, Paterson, N. J.

San Francisco News.

The sales of wheat, flour, barley, fruit, &c., though at much lower prices than last year, have been so much larger than they were then that the prospect of business should be equally good. It has not been as good yet as it was then, but matters are improving, and business in hardware, iron, &c., has been much better than it was a little while ago. The value of the produce sold to date in a few of the leading articles has been equal to a round \$9,000,000, and though that may not seem large to an Eastern business man it seems a good deal to the people in trade in this city, especially when it just represents the business done for the past three months only. These figures make no account of lumber, borax, wool, quicksilver or metals and minerals of various kinds, which would add very considerably to the total. There is an improvement, but a very light one, when compared with the falling off shown by the figures of the Clearing House, which vary all the way from 25 to 30 per cent. below those of a year ago. There is a fair demand springing up for builders' and farm hardware. Agricultural implements are selling in smaller quantity than they were a year ago. The demand for machinery is light, and as considerable of that has been supplied from the East the dullness of the times is felt by the agents of Eastern houses here. They try to put on a cheerful face before representatives of the press, but in private they will tell you that business was never duller.

The sales of nails are increasing somewhat. They have been dull and a big reduction was made some time ago, but that does not seem to improve the market. The "Commodore T. H. Allen," the "Florence" and the "Reuce" have come to hand recently with 6039 kegs. Receipts by rail for a long time have been very light. The jobbing rate for iron is \$1.75 per keg, but it is said that the Nail Company have been selling as low as \$1.65 per keg. This is a great difference compared to the old-time prices—about one-half. Prices have dropped rapidly this year. The Nail Company are talking of building again, but the cost would be very great and it is somewhat uncertain when they may start in. It is hard to get money and the price of nails is low. The consumption of California, Oregon and Washington is probably 600,000 kegs a year, worth at present prices about \$1,000,000 a year. Now, with any sort of decent freight rates, all these nails could be supplied from this city. At present a little over one half of them is so supplied. They might all be, while the present factory could manufacture about one-half of them. We have, since the 1st of the year, received a few thousand kegs from Washington.

The pig iron business is duller than ever before. I have given you some figures as to consumption here. Now,

since the first of the year the imports have slightly exceeded 8000 tons, of which 2000 tons have been from Great Britain. It will thus be seen that American iron now commands the market. It, however, sells very low, not to exceed \$18 per ton. English and Scotch, when either is wanted, command about \$4 more. The imports of scrap have fallen off almost altogether since the first of the year. This tells the story of the decline of business in our manufacturing establishments very eloquently.

There have been no imports of pig tin or tin plate for the past two weeks, but the market continues very dull in both. Tin plate is quotable at \$5 50 to \$5.60 for coke, and pig tin sells in small lots occasionally at 21½ cents to 22 cents. Of course, the purchasing for the canning season has been much more extensive than was expected.

The Naval Architects.

The first general meeting of the Society of Naval Architects and Marine Engineers will take place in New York City at 10 a.m. Thursday, November 16, 1893, in the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, the sessions extending through Thursday and Friday, November 16 and 17. The following is a preliminary list of papers to be read: "Transatlantic Navigation," Charles H. Cramp, president Wm. Cramp & Sons' Ship and Engine Building Company, Philadelphia, Pa.; "Steel Ships of the United States Navy," Theodore D. Wilson, ex-Chief Constructor, U. S. N.; "The Development of Shipbuilding on the Great Lakes," Jno. F. Pankhurst, vice-president and general manager Globe Iron Works, Cleveland, Ohio; "Notes on the Machinery of the New Vessels of the United States Navy," George W. Melville, Engineer-in-Chief, U. S. Navy; "Coal Bunkers and Coal-ing Ships," Albert P. Niblack, lieutenant, U. S. Navy; "Production in the United States of Heavy Steel Engine, Gun and Armor Forgings," Russell W. Davenport, vice-president Bethlehem Iron Company, South Bethlehem, Pa.; "Determination of the Approximate Dimensions of a Vessel to Fulfill a Given Programme of Requirements," Joseph J. Woodward, naval constructor, U. S. Navy; "Comparative Performances of American and Foreign Freighting Ships—Our Superiority," Wm. W. Bates, late Commissioner of Navigation, Treasury Department; "The Wetted Surface of Ships," David W. Taylor, Naval Constructor, U. S. N.; "The Influence of Speed and Weight of Machinery on the Determination of the Other Elements of the Design of Steam Vessels," John J. O'Neill, Naval Architect and Marine Engineer; "United States Treasury Rules for the Inspection of Machinery and Boilers," Jas. T. Boyd, general manager George F. Blake Mfg. Company. Papers are also expected from the following gentlemen, but the exact titles have have not yet been decided upon: Col. Edwin A. Stevens, president Hoboken ferries; A. Cass Canfield, member America's Cup Committee, New York Yacht Club; Joseph H. Linnard, naval constructor, U. S. N.

The recent depression in business has had a marked effect in decreasing the consumption of tobacco and beer, as shown in a material falling off in the internal revenue from those manufactures.

Intricate Drop Forgings.

Less than half a century ago necessity created a demand for "blacksmithing by machinery," or, as it is now commercially and generally termed "drop forging." The success of articles made by this process was first demonstrated in the production of firearms, sewing machines, &c., and in no small measure have they contributed to the enviable reputation of this country for superior machinery of all description. So rapidly has this industry grown and so widely have its products found acceptance that it would be a task of vast magnitude to even attempt to enumerate the several uses of drop forgings.

Any well equipped machine shop will be found capable of producing dies. To use these, however, for drop forging purposes without the genius embodied in the break-down impressions would be wholly impracticable. This factor has been especially prominent in the making of drop forging a distinct class of work, and to the successful application of the inherent principle of a smithy's art is almost wholly due that improvement which makes the adoption of drop forging almost universal.

As showing some of the difficulties encountered in drop forging we present drawings of some specimens of intricate work, and a description showing in more or less detail the exact methods pursued from the time the order is received in the office until the final prod-

come worn beyond the standard allowance for that particular piece. Taking an ordinary lathe dog as an illustration, the sheet steel templets are nine in number, one giving the horizontal or flat outline of the dog, the others, when placed on the edges of the dies, outlining the several curves and their depths at different angles. In other words, considering the die as simply a block formed with irregular depressions, these templets serve to show when the die sinker has on any particular line reached the exact distance below the surface of the block, and also to inform him when he has obtained the exact degree of curvature.

It will be observed that the foreman in this case has no guide whatever, except his own experience and judgment.

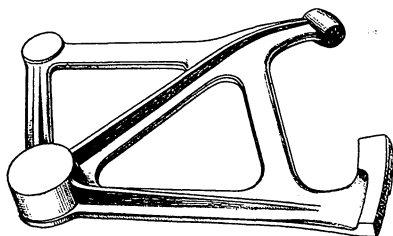


Fig. 1.—Shuttle Carrier.

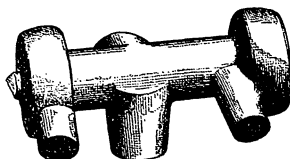


Fig. 3.—Bicycle Crank Axle Drum.

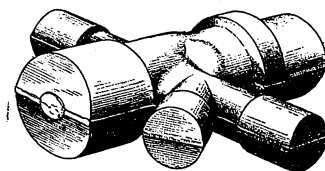


Fig. 5.—Ammonia Pipe Fitting.



Fig. 2.—Shuttle.

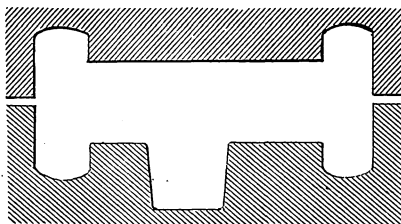


Fig. 4.—Section through Dies for Fig. 3.

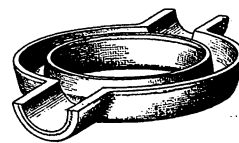


Fig. 6.—Bicycle Fork Connection.

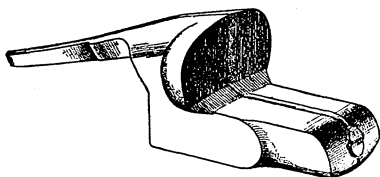


Fig. 8.—Gun Frame.

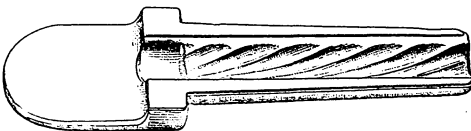


Fig. 9.—Wire Rope Clamp.

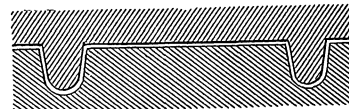


Fig. 7.—Section through Dies for Fig. 6.

INTRICATE DROP FORGINGS.

Contrary to the prevalent idea, the process of drop forging is the most expensive way of working metal, if but small quantities of forgings are desired. As the production of a single forging involves the entire cost of sinking dies and the making of all tools, each forging in the first product must necessarily bear its share of cost pro rata. This fact alone debar the absorption of the entire source of trade now supplied by castings and hand forgings, and as the art advances and the cost of production is reduced, that field, necessarily for its own good, must be further encroached upon. Therefore, drop forging should be classed as a work distinct and apart from that of steam or helve hammer forging, hydraulic press and hot-rolled work. Aside from the invaluable possibility of duplicating, the superiority of drop over hand forgings is due to the almost perfect homogeneity resulting from the continued pounding of a heavy hammer mechanically, yet wholly under the control of the drop hand.

uct is shipped. It is through the courtesy of J. H. Williams & Co. of Richards and Bowne streets, Brooklyn, N. Y., that we are enabled to give our readers an account of the process carried along in their extensive establishment.

First Work Necessary.

The order for a special forging may be accompanied by merely a verbal description and rough or scale drawing giving the dimensions, or a pattern more or less perfect. This forms the foundation and is handed from the office to the foreman of the die-sinking department. His first work consists in the making of sheet steel templets or gauges, which serve the die sinker as guides in his work and by means of which the final dies may be finished. After the dies have been sent to the hammer department these templets serve to tell when the dies have been worn out and when they should be either discarded or resunk, as, on account of the wear resulting from use, they have be-

Of course, his object is to so make his templets that there may be no possibility of error on the part of the die sinker and that there may be no confusion in regard to his work as it progresses. This is essential, from the fact that in the die-sinking department all work is of the most expensive character, only the first outlining or roughing being done by machinery, the final fitting and bringing to the perfect outline being hand work by men receiving high wages.

Die Sinking.

The die-sinking department resembles, in a certain sense, a well-equipped tool room. We find lathes, drills, shapers and planers of common form. The two blocks forming the male and female dies are machined wherever possible in order to save subsequent hand work. We find here a special tool, known as the die sinking machine, resembling in its spindle and spindle driving gear the ordinary upright drill, but being provided with carriages, by

means of which the work held below the spindle can be placed at any desired angle and can be moved in any desired direction. The cutter, carried by the vertical spindle in precisely the same way as would a drill, is a milling cutter shaped according to the cut it is desired to make in the block. For instance, the female die for forming the curve in the bicycle frame connection, shown in Fig. 6, would be a round nose milling cutter, which would cut this curve to a depth and width sufficient to obviate in a great part any subsequent hand work. The universal movements of this machine and the rapidity of its operation and accuracy with which it can be manipulated, make it one of the most essential appliances in the department.

After having been machined as far as possible, the final work is done by hand by means of a hammer and cold chisel, the surface finally being brought

the forging, which is submitted to the customer and by him altered or corrected as may be necessary. This is done as a safeguard and is practically forced upon the proprietors of the forge shop by reason of the fact that the orders they receive are not always perfectly explicit, and by submitting a proof they not only permit of alterations being made but also guard against final dispute.

Adjusting in Hammer.

Each die is formed with what is termed a shank on its surface opposite the face, this being provided in order that the dies may be attached respectively to the anvil and ram of the hammer. The shank is dovetailed, in order to fit in a corresponding opening in the hammer, and upon one side of the dovetail is inserted a wedge, which holds the block in position and also permits of its adjustment forward and back-

no guide can be followed and no rules formulated. The success of the operation depends solely upon the experience and judgment of the temperer, and when we state that the man who is now doing that work for the Williams Company has been before a forge fire for 53 years and over and is now doing all their tempering, the fact will be appreciated that his success is due in a large measure to long experience. The dies are now ready to go to the hammer.

Breaking-Down Dies.

The most difficult part of the whole business to learn, and at the same time the most essential branch, consists in designing the breaking-down dies. This is for the reason that not only the success of the work done by the forming dies is dependent upon the work produced by these dies, but also the cost of the whole operation, and especially the amount of waste material, which is



Fig. 10.—Bicycle Fork Head.

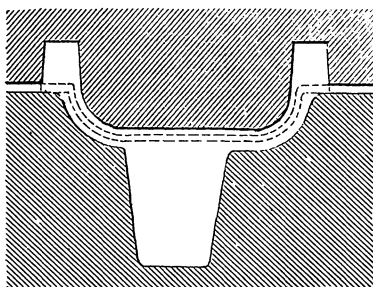


Fig. 11.—Section through Dies for Fig. 10.

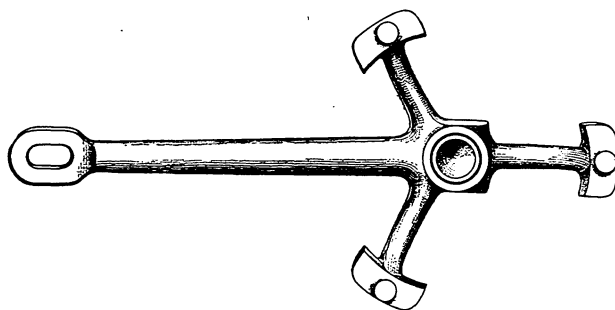


Fig. 12.—Bicycle Sprocket Crank.

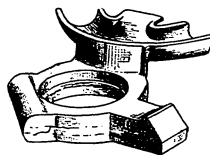


Fig. 13.—Bicycle Crank-Bearing Connection.

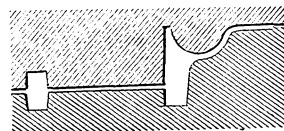


Fig. 14.—Section through Dies for Fig. 13.

INTRICATE DROP FORGINGS.

to a fine finish with the aid of scrapers and rifflers, and in some cases, where the surface desired is unusually fine, the dies are polished with emery.

As is well known the dies consist of two blocks, male and female, which may or may not, according to the form of forging they are intended to make, be reversed duplicates of each other. In the laying out of the dies by the foreman, and in the making of his templets, he must first decide how he will cut the cavities in the dies in order that they may draw. This is precisely the same question that confronts the molder who receives a pattern. He must decide how he will mold it in order that the two parts of his mold may be separated and permit the withdrawal of the pattern. Two dies practically form a mold, which, under the operation of the hammer, is filled with the metal forming the forging, and it is therefore essential that upon the separation of the dies the withdrawal of the forging should be an easy task.

Lead Proving.

The dies having been finished are bolted together and lead poured in the impression in order to furnish a proof of

ward. Sidewise adjustment is provided in the hammer itself. The guides carrying the ram can be moved so as to bring the upper die in any desired relation to the lower one. These two means of adjustment, front and back, and the right and left, are necessary, in order that the two dies may come together perfectly in line, and at the same time they permit of adjustment being made for wear in the hammer itself.

Tempering.

Some dies are tempered and some are not, according to the size of the die, the character of the forging it is expected to make and also the number of forgings called for. Where the edges are sharp and a great number of impressions are to be made steel of the highest quality is used, and it is tempered as hard as fire and water will make it. The first process in tempering is to heat the block evenly and thoroughly all the way through in an ordinary charcoal fire. It is then cooled entirely in water, after which it is again placed in the fire, warmed slightly to produce the desired color—usually a straw or copper—and cooled again in water.

This is one of the operations in which

a result in all drop forging processes, depends directly upon their correct form. This will be appreciated from the following: The shuttle carrier shown in Fig. 1 measures 6 inches horizontally and 5½ inches vertically. It is formed from a steel bar 2 inches wide by ¼ inch thick. It is the work of the breaking-down dies to so distribute the metal of this bar that at the hub it will be collected or increased in thickness, that sufficient depth will be provided for the two right-hand ends, and that the metal will be formed up so that the finishing dies will have material enough in order to form the webs of the arms. The forming dies are approximate in shape to the finishing dies, but the edges are so arranged and curved as to force the metal in the desired direction. This specimen, Fig. 1, could be made directly by the finishing dies by providing metal of the desired thickness and width, but it is very evident that the work required of the dies would then be altogether too severe in character, and further than this, that the amount of metal wasted and going to the scrap heap would be out of all proportion. It is for this reason, and this reason alone, that the breaking-down

dies occupy such a prominent position in a drop-forging establishment. Sometimes in the case of small work the breaking-down dies and the finishing dies are cut on the same blocks. This is done mainly to save time, as at one heat the piece can be broken down to approximate shape and then passed to the finishing dies.

Trimming Dies.

Referring now to Fig. 1 and also Fig. 12, which are good examples of the part played by the trimming dies: As these two pieces leave the finishing dies the inner spaces and also around all the outer edges are filled with a thin web of metal caused by the surplus metal spreading out between the dies. It becomes necessary to remove this metal and the trimming dies are called into operation. They are constructed and they operate on the same principle as the common press. The punch corresponds in outline to the forging, which is forced through a die, the edges of which, in connection with the action of the punch, remove all the surplus metal in the openings and around the edges. The forging is then delivered or finished at the works, as the original order may call for.

Forge Shop.

In the forge shop we find a collection of drop hammers, ranging in capacity from 200 to 2000 pounds, trip and helve hammers and a steam hammer, the principal work of which is to aid the breaking-down dies and bring the piece as far as possible to a form approximating the form desired. Hard coal is used in all the furnaces, which are arranged down each side of the shop, and to which air is supplied by two blowers. There has also been recently introduced an upsetting machine intended for massing the metal on the end of bars, which otherwise would have to be made of stock the size of the head desired, and which would have to be hammered down in order to produce the smaller portion. This has been found extremely useful and has greatly aided and saved both time and expense.

Resinking Dies.

When dies have become so worn by long use—and we may state parenthetically that the life of a die varies from 300 to 20,000 forgings, according to the intricacy of the pattern—that the forging no longer comes up to the standard required, it becomes a question whether or not to discard the die completely or to re-sink it. If it is desired to re-sink it the temper is drawn and it is returned to the die-sinking department. Here the templets used in first construction are again brought into play and the face of the die planed off to the depth at which it has been decided to re-sink the pattern. The work from here on is in no way different from what was done in the first making of the die. Whenever possible a die is re-sunk for the simple reason that much preliminary work has already been done, and although it may have been worn considerably it still approaches very nearly to the exact form needed.

Quality of Steel.

Steel for dies varies from the softest steel obtainable to the highest quality of tool steel, this depending, as previously stated, solely upon the size and form of the forging desired. When there are many and sharp edges, and when the order calls for an unusual number, only steel of the finest quality is used. Steel is received in bars for

the forging and in hammered blocks for the dies, and in the former case is piled in racks under suitable classification, in order that the shapes and quality may be easily kept track of.

Accuracy of Drop Forging.

It may seem strange to state that drop forging can be done so that it will gauge to within 0.001 inch. It will be evident that this could not be done with the metal hot, since it would not be possible for any hammer man to so heat his metal that there would not be a variation in size due to a difference in temperature. Therefore, when forging of this character is desired it is forged hot as closely as possible and then cooled and hammered cold to gauge.

Illustrations.

Our drawings were made from specimens selected at random, the endeavor being to show the intricacy of some of the work and at the same time to convey some idea of the range. Fig. 7 is an approximate cross section of Fig. 6, and shows the upper and lower dies and spaces between the two dies representing a cross section of the completed forging. The same is true in Figs. 3 and 4, 10 and 11, and 13 and 14. These are merely presented in order that an estimate may be formed of the character of the work done and how it is done, and particularly of the change which takes place in the shape of the metal in the dies.

Treatment of Forgings.

During the operation of forging the piece is brushed with a steel brush in order to remove the scale made by the hammer. If the piece, in order to complete it, is to be machined, the scale is pickled off in a weak sulphuric acid bath. When the pieces are to be case hardened they are placed in a muffle, packed with crushed bone and leather, and heated in a furnace. Forgings presenting sharp and well-defined edges are dumped from the furnace into oil, the planer and rounded shapes being immersed in water.

Keeping Track of Work.

In the foreman's office is a blank order book in which is entered each entry as it comes from the office, and which contains all instructions necessary. The items covered are as follows: Name of article, quantity required, material to be made of, size of material from which it is to be made, rack in which this material is found, anneal, pickle, number of dies, previous order, model, specimen, promised, shipped, net weight, lead proof or not. There is also space on each page for a record to be kept of the material taken from the stock room, and also of any surplus material returned to the stock room. Careful entries are made from time to time under the different heads of these orders, and at an instant's notice the exact condition of the work can be ascertained.

Regular Work Done.

J. H. Williams & Co., in addition to a varied business in special forgings for outside parties, as is shown by an inspection of their die room, in which are some 2000 dies which they made and which are kept on hand in case they may be needed at some time in the future, do much forging for their own particular line of manufacture. They now make forgings from iron, steel, copper, bronze and aluminum, the latter working well under the hammer, but requiring extreme care in heating

in the furnace, since, as is well known, it melts without giving to the eye any indication of heat. Among the regular work made by them are the well-known Brock chain pipe wrenches, single and double head engineers' wrenches, lathe dogs, thumb nut and thumb screw blanks, bicycle wrenches, and the like. Their special forgings have covered almost every line where it has been possible to introduce a forging in bicycle work, electrical appliances, pumps, railway appliances, sewing machines, typewriters, firearms, machinists' tools, &c. The quality of the work produced and the possibility of reducing the weight, and at the same time increasing the strength by means of drop steel forgings, have combined to constantly and quickly enlarge their field of operations. To appreciate this fact one must inspect, as shown in their office, their show boards, upon which are artistically arranged many of the specimens of work they have recently produced.

Wood Working Machinery at the Fair.

The display of wood working machinery at the World's Fair is a very fine one. The exhibits illustrate the great progress which has been made in this line of mechanical development during recent years. Many of the machines shown are triumphs of ingenuity. An interesting feature is also the remarkable manner in which difficult pieces of work are equally well accomplished by several radically different methods. The exhibits described are located in Machinery Hall.

The J. A. Fay & Egan Company

of Cincinnati, Ohio, have exhibits at Column F 38 and 41, which in completeness and size are characteristic of the company making them. A 42-inch triple drum floor sander shares the honors of attention from machinery men with a triple cylinder flooring machine and a timber planer for dressing stock as large as 16 x 20 inches on four sides. A band saw is exhibited which can saw stock 24 x 48 inches, also a hollow chisel mortiser $\frac{3}{4}$ x $2\frac{1}{2}$ inches. The entire display embraces 46 machines for use in planing mills, box and furniture factories, spoke and handle works, car shops, shipyards, &c. O. C. Wysong, in charge of the exhibit, says: "The latest thing on the market is the double end car tenoning machine, so constructed as to tenon long sills without having to turn the stock around, thereby saving time and space." On this machine, which cuts two tenons at once, instead of a carriage moving the main frame travels on planed ways by means of a screw which operates by friction. This may also be used as a cut off saw or gaging machine. Its weight is 10,000 pounds and it is highly approved by car builders. A new twin screw planer planes the stock on the sides 14 x 18 inches, is arranged to take the bottom cut first, and is provided with a hand wheel so that the bottom cut lower cylinder can be changed instantly without changing the size of the timber being dressed. It has eight feed rolls, all powerfully geared and making a positive feed, being raised and lowered by power. This machine has only recently been placed upon the market, but in that short time has met with pronounced favor. About 30 Reeves pulleys and

as many belts from the Page Belting Company's Works form a perfect net work in this exhibit around a booth used as an office and reception room in the center of the space. This booth is appropriately draped in red, white and blue.

The Hall & Brown Wood Working Machine Company

of St. Louis, Mo., have erected a booth of Georgia yellow pine within their area of 30 x 50 feet, at Column F 51. Here they exhibit to advantage 15 of their wood working machines, among which are included their band saw, 10-inch molder, No. 9 Hoo Hoo planer, one masber, two Mississippi matchers and an automatic double box cut off saw. The No. 9 Hoo Hoo, mentioned above, is adapted for almost any stock of heavy dimension for flooring and ceiling. Both the feed rolls are broken and two pieces may be fed at once from 8 x 12 to 1 x 1. The weight of this ponderous machine is 14,000 pounds; it is well constructed and free from complications. The stock goes to the top cylinder, 30 inches long, 5 inches cutting circle, and then passes to side heads, which edge the board, and it is then passed on to the lower cylinder, which planes the under side. This planer, which is in operation, is provided with feeding out wheels which carry the board through the machine. J. F. Judd, who has charge of the display, prides himself on having the only exhibit in this line which is piped for carrying away sawdust, shavings, &c.

Paul Frybll

of New York City occupies about 900 square feet, at Column F 45, with his special machinery. From an overhead shafting some 45 pulleys and belts propel band and jig saws, planers, twist and fluting machines, corner block and rosette machinery, an edge molder, double and single borers, mortiser, drill for piano plates, piano action machine and a piano plate borer, which stands alone in its class. The last named machine has a double platform for carrying the piano plate, while overhead a suspended drill works upon it. A new parallel swing saw, which has only been on the market about six months, is doing good work and attracting considerable attention from the trade. An oval lathe for turning ovals is also deserving of more than passing mention and completes a very extensive exhibit.

Greenlee Bros. & Co.

of Chicago are located at Column F 48. Their exhibit covers in the neighborhood of 2000 square feet, being bounded by three aisles. A handsome oak booth in the shape of a pagoda has been constructed in the center, with maple flooring, and is occupied by Messrs. Gray and Carse, in charge of the exhibit, as an office and reception room. The line of high grade wood working machinery and special tools which this firm manufacture is so well known to the trade at large that a detailed description of all of them is superfluous. Probably the most attention is paid to their hollow chisel mortise machines, in which they make everything demanded from small sash work up to the large No. 7 car mortising machine, which mortises 2½ inches square, and carries on table, by power, timbers 70 feet in length. The double compound automatic machine shown has four hollow chisels operating on two door stiles at the same time by one operator, who clamps them to the table, thereby taking any wind out of them, and also feeding them to the

stops, thus requiring no "laying out." This machine will blind mortise or mortise clear through two stiles at one operation. The advantage claimed for this over a chain mortising machine is that it will operate upon hardwood also, and the mortises are always square. Its remarkable points are its adjustments and high speed of gears revolving the bits, which make 5000 revolutions per minute, with no perceptible noise or wear. In addition, they also have a full line of self feeding saw tables, of which they are the inventors, embracing a No. 0 machine which rips 2-inch stock, and various other sizes up to a No. 12, capable of ripping 12-inch plank. Their latest improvement is an adjustable outfeeding device back of saw. They also have on exhibition a full line of anti-cut off machines, both single and double. The double machines are designed more for railroad work, it being possible to cross cut both ends of several pieces of flooring or siding by one operation at the same time. Here, too, are found two of their special sash, door and blind machines.

The Dubuque Specialty Machine Works

of Dubuque, Iowa, show their chain mortiser in operation at Column F 52. This machine is made in three sizes and is specially adapted for sash and door work, furniture factories and light stock work of all kinds. The three points which are claimed for it by the manufacturers are, accuracy, excellence of work and rapidity. It is simple and entirely automatic, the saw being fixed and the table bringing the stock to the tool along a vertical slide and dropping it again at the completion of the cut. The mortiser proper is composed of a chain of cutters riveted together, propelled by a sprocket and guided about a fixed bar with roller bearing at the point. A bright boy can operate it; it is easily kept in order, may be sharpened in three minutes and is adapted to all sizes from ¼ inch to 1 inch.

Charles L. Goehring

of Allegheny, Pa., has on exhibition at Column F 35 several of his immense machines for cutting geometrical moldings out of solid wood. There is a high speed molder of 16,000 pounds weight which requires no sand papering on the molding and produces perfectly smooth stock with a dead finish. The geometrical center piece circle machine tips the beam at 4500 pounds. It is excellent for oval, circular and geometrical figure of eight carving. A geometrical panel machine carves nine figures on door paneling at the same time. Completing the exhibit is the geometrical carver and molder, which operates as rapidly as straight work. The last named machine weighs 18,000 pounds. The Goehring geometrical molding machines are meeting with pronounced success in England and on the Continent of Europe.

The Fox Machine Company

of Grand Rapids, Mich., manufacturers of Universal mitering machines, show a full line of them at column J 43. The Universal trimmer is built in three sizes and five styles, including the latest improved trimmer, which cuts a back angle for a pattern maker, cutting any desired angle from 30° to 135°. These manufacturers build and show miter machines for belt and foot power, also cooping machines for factories. Included in their exhibit is a full line of dado saws or grooving heads, among

them being a 62-inch machine, carrying five heads. A three-spindle boring machine, with tilt table, is likewise shown; also a 30-inch open side shaper and a 15-inch crank shaper. A planer chuck recently produced is on exhibition, together with corrugated sash pulleys, the latter wholly made of sheet steel by an ingenious process. Considerable attention is bestowed upon the quadruple bit for corrugated pulleys, making four holes at once, for the insertion of pulleys.

The Milwaukee Carving Company

of Milwaukee, Wis., show at Column G 44 one of the most interesting exhibits in their carving machine and samples of its work. It is particularly adapted for the furniture trade and interior decoration. The work is all done from a model, the machine consisting of four cutters connected in a yoke which follows a tracer, reproducing the model four times. The power is transmitted through a flexible shaft, the speed of each cutter being 15,000 revolutions per minute. It measures 7½ feet wide and weighs 2200 pounds, producing the heaviest work with large tools as well as the finest and most delicate work with smaller tools, varying in size down to a pin point. It will also cut one piece 40 inches, two pieces 20 inches and four pieces 10 inches in width, of any length and thickness up to 16 inches, finishing the work perfectly with the exception of sandpapering. Among other figures on exhibition are reproductions from a bust of Gladstone carved by the Seaman machine, of English manufacture; a head of Columbus in relief work which is very appropriate, and other ornamental and panel work, receiving much attention and many compliments.

The John A. White Company

of Dover, N. H., display at Column E 50 seven wood working machines, all in operation, in the 700 feet of space which their exhibit occupies. This collection includes the latest combination band resaw. They show one 54-inch resaw, one 26-inch Dover planer, one 16-inch planer, and a 24-inch Concord planer, besides lathes and circular saw tables. They further exhibit an improved method of power transmission, by which it is claimed that an irresistible force is derived from the edge of the belt. These goods were exhibited last year in Boston, where they received the gold medal. R. J. Butcher, road representative of the company, has the present exhibit in charge, and reports having sold one consignment of machines from the World's Fair samples to be shipped to Madras, India. A large photograph is prominently displayed of their works at Dover, N. H., which have been run full time during the prevailing depression in business.

The Art Embossing Machine Company

of Indianapolis, Ind., have in operation at Column F 33 one of their wood embossing machines. It is constructed of a bronze mandrel running on automatic friction rolls, with dies of any figure desired placed on the revolving mandrel and heated from within by gas, gasoline, &c. The stock is then passed through under pressure, receiving the design from the die above and at the same time taking color and smooth finish from the heat. The machine is provided with a pilot wheel for different thicknesses of stock and by a cam lever is thrown into or out of contact with

the die instantly. This machine is suitable for furniture work, moldings, car finish or any design on any wood desired, or produces an inlaid effect by bringing the hot die in contact with the surface, coloring the wood according to design.

The American Wood Decorating Machine Company

of New York City, by means of their wood embossing machine, shown at Column F 45, produce a very close imitation of hand carved work, so that few are able to detect the difference. The machine consists of a solid revolving die operated by friction. Work is done upon all kinds of hardwood, of which numerous fine samples are shown. This machine operates on any shaped piece of wood, working on circles, sweeps, insides and outsides equally well, executing all manner of figures and designs. They do not cater to heavy scroll work.

The Rohlmann Mfg. Co.

of St. Joseph, Mo., have their improved carving machine on exhibition at Column G 33, which carves four duplicate pieces at one operation up to 12 inches wide, or two duplicate pieces of any length up to 33 inches in width, or one piece as wide as 30 inches. The bits may be handled conveniently and in any direction within an angle of 30°, the top or table being raised or lowered to make thick or thin work and remaining the proper height for the operator. The table rests upon sliding ways, so that it can be adjusted for the convenience of the workman on different varieties of work. An advantage claimed over other machines is its adaptability for different kinds of ornamental work without extra attachments, owing to the arrangement of cutters. These are so arranged that they may be carried in any direction, cutting under an angle of 30°. By a recently improved and original device all chips and dust accumulating are blown from the carvings, thereby assisting the operator. In chair patterns, panels, reliefs, statuettes, &c., the machine turns out remarkably fine work.

Goodell & Waters

of Philadelphia have an immense planer on exhibition at Column G 48 capable of planing four sides at one time. A "sticker" dresses, tongues and grooves the stock at one operation. Other machinery shown includes a band saw, one 12-inch jointer and countershafts.

Moore Carving Machine Company

of Minneapolis, Minn., have, at Column G 34, a handsome booth of ebony finish, 16 feet square, containing much of interest, on which visitors bestow a vast amount of admiration. The wood carving machine shown has four cutters, with an attachment of a pair of centers with tables for getting all degrees of undercuts. The model from which the machine works can be either hand carved, plaster of paris or papier mache. The figure on which the machine was working when a representative of this paper called last week was the well-known Venus, Goddess of Love, perhaps more familiarly known as the Lady on the Shell. This model is of plaster of paris, and four reproductions were made in four days, each valued at \$75. One of the points commending this machine to manufacturers who use a carving machine is the width and thickness of stock which can be used and the work which can be done to advantage on the full length of any panel, either of hard

or soft wood. This machine has only been on the market five years, but already there are nearly 100 working in Europe and five times that number in this country.

The Berlin Machine Works

of Beloit, Wis., have at Column F 42 one of the largest and most complete exhibits of wood working machinery. It occupies a space of 40 x 55 feet, which fronts on three different aisles and is inclosed by a neat iron railing. This exhibit may be divided into three departments, namely: Planing mill machinery, furniture trade machinery, including glue jointers and the Invincible sanders. The improved planer and matcher made by this company will work stock 6 x 15 inches. The cylinders make 4500 revolutions a minute, and a marked feature is the connection of rollers with self-oiling bearings instead of transmission by gears, thereby running rolls without vibration and having chip breakers on top and bottom cylinders. They also have the finest crucible steel arbors and all gearing inside of the frame, thus running cylinder pulleys close to cylinder boxes. The spindles measure 2 3/4 inches in diameter and the bearings 11 inches in length, with an improved cam locking device to lock the matcher spindles, avoiding variations. This size machine working stock 6 x 15 inches, weighs 11,000 pounds, which is 3000 more than the ordinary matcher of the same style. All parts are perfectly adjustable and interchangeable. The inside molder is of similar construction and possesses many of the same points of excellence. It is a 12-inch inside molder, having an extra bottom cylinder, and possessing all the advantages of an outside molder, throwing the heads horizontally, having the latest improved gearing. It is durably and scientifically constructed for accuracy and rapidity, being aptly termed the planing mill man's friend. The Beloit manufacturers also display a single cabinet surfacer with sectional broken rolls, all the rolls being weighted with improved fast and slow feeding device, neither a friction nor clutch, but a simple and accurate operation. A description of their machinery would indeed be incomplete without reference to the Invincible sander, which for the past 15 years has sustained an enviable reputation for producing a high level parallel finish. By the triple drum a positive and accurate oscillation of the steel cylinder is secured. One of their Junior Sanders is also included in the exhibit. The glue jointer shown was only introduced a year ago. Other machinery shown includes a self feeding rip saw, double shaper and a buzz planer or hand jointer. The display is in charge of the company's genial salesman, Mr. Kelly.

E. & H. Holmes

of Buffalo, N. Y., exhibit at Column F 50, Machinery Hall, a variety of wood working machines, including machinery for the production of barrels and kegs. Prominent in this display is the King timber planer and sizer, claimed to be the largest exhibited at the fair. It will work pieces 26 inches wide and 16 inches thick, and planes all four sides. Another notable machine is the Niagara endless bed double surfacer with feeding out rolls, built to work 26 and 30 inches wide and 12 inches thick. In addition are shown the Erie fast feed flooring machine, an improved circular resaw, an improved gang edger with straightening attachment, an improved spur feed rip saw hand

siding machine, an improved balancing scale for planer knives, a new automatic knife grinder, &c., comprising in all 15 patterns of high class machinery. An important feature of the exhibit is a variable feeding device which can be applied to all planers and matchers and is regarded as a most valuable improvement in the operation of wood working machinery. The manufacturers state that it thoroughly regulates the speed of the machine, so that the operator can adjust it to a nicety, whether the material be wide or narrow, or the cut heavy or light, and whether the wood be hard or soft. It can be changed instantly without stopping the machine or the motion of the material, and it is claimed that by its use one-third can be added to the output of the machine. The keg machinery shown is in extensive use among makers of nail kegs. Edwin Bell's Sons & Co., very large manufacturers of nail kegs, whose operations are conducted at various nail making centers, have recently made heavy purchases of the machinery manufactured by the Messrs. Holmes. The exhibit is in charge of E. B. Holmes and A. E. Lambert.

H. B. Smith Machine Company

of Smithville, Burlington County, N. J., make a very large exhibit of their machines at Column F 46, Machinery Hall. The display includes a planer and matcher, a new six-roll double surface planer working up to 26 inches in width and 16 inches thick, a cabinet surface planer, a new single surface planer, a new hand planer or jointer, new 10, 9, 8, 7 and 6 inch molding machines, an improved double spindle irregular shaping machine, a single spindle reversible shaping machine, an improved panel raising machine, a blind rabbeting, beading and jointing machine, a double end tenoning machine with double cut off saws in front, a double end tenoning machine with double cut off saws in the rear, a new single tenoning machine, a new self feed blind slat tenoning machine, a power mortiser with boring attachment and clamp table and rack and pinion feed, foot power mortiser, band saws, resaws, sawing tables, relishing machine with attachment for dovetailing sash, a three-spindle boring machine, geometrical carving machine, miter cutting machines, lathes, &c. The special features shown in connection with many of these machines would require unlimited space for their enumeration. An example is the new carriage devised for No. 2 tenoning machine. This is now mounted on rollers instead of slides, greatly decreasing the friction and adding much to the ease of operating the machine. The geometrical carver is a machine of simple design, easily operated, but capable of a great variety of work in carving corner blocks, rosettes, &c. The designs of which it is capable are almost innumerable. The company also have on exhibition the Haines patent blind slat tenoning machine, which operates two slats at once, the slats being revolved by power, thus increasing the output at least 50 per cent. The display is in charge of Wm. S. Kelly.

The S. A. Woods Machine Company

of Boston, Mass., exhibit 15 machines at Column F 35, Machinery Hall. In such an exhibit as the Woods Company have made it is difficult to determine which is the most deserving of mention. Perhaps their new double surfacer and sizer attracts as much at-

tention as any one machine shown. It is intended for planing all kinds of bill timber perfectly square, beading heavy girders and a variety of mill work. By use of a center guide two pieces may be dressed simultaneously on three sides each. By use of a power hoist the machine is quickly changed while running so that timber of various sizes can be planed without sorting, or two pieces of unequal thickness run through at the same time. Another machine deserving the many good things said of it is the 24-inch single shop surfacer, especially adapted where a strong feed and fine finish are necessary. The bed moves up or down on gibbed ways located to obtain great steadiness, and the elevating screws are of large diameter, aiding to keep the bed firm and steady. The new automatic knife grinder with power feed for wet or dry grinding is a very superior machine, having an absolutely straight and true edge. The machine is very compact, solid upon the floor and no jar is experienced in running. Other machines on exhibition are their automatic floor board boring machine, 38-inch band saw machine, a heavy pattern self feed saw table, double iron adjustable saw table, circular resawing machine, improved jointing and facing machine, new cabinet surface planer, and their four-roll molding machine.

J. Hallawell

of North Mernon, Ind., has on exhibition at Column I 35 one of the hub boring machines which he manufactures. These machines bore from both sides at the same time, and have a capacity of 3000 planks per day. One pair of augers will bore 1,000,000 blocks, and they may be resharpened in three minutes. A prominent feature of the display is a pyramid of blocks in one corner of the space.

The American Well Works of Aurora, Ill., have secured a medal for their revolving process machine, by which wells are sunk by the revolving of the tubing and a stream of water washes out the borings. The deepest and largest wells sunk in alluvial formations, quicksand, &c., have been sunk with it. J. W. Byrnes & Co. have sunk a well with it at Galveston, Texas. It was commenced with 22-inch bore, and is sunk to a depth of 3067 feet in quicksand and clay, with alternate strata of hard materials.

The Verein zur Beförderung des Gewerbflusses of Berlin has awarded to Professor Ledebur the prize for an essay on the reliability of current methods for the estimation of carbon in iron and steel. The memoir is printed in full in the last issue of the Transactions. Professor Ledebur prefers the Saernstroem methods.

Judging from the number of meetings being held and their stormy character, the representative members of the Finishers' Association of the Youngstown district would rival our national legislators as prize talkers over a vague subject.

The Berlin Iron Bridge Company of East Berlin, Gonn., have received the contract for the new draw bridge at Salem, Mass. The bridge will have a 60 feet opening with a roadway 28 feet wide in the clear, and two sidewalks each 6 feet wide. It will be a deck plate girder construction.

THE WEEK.

To encourage the mining industry of Chile the Government of that Republic has, as previously mentioned in these columns, decided to hold a mining and metallurgical exposition at Santiago, opening on March 15, 1894. Foreign manufacturers have been invited to exhibit machinery and tools and other apparatus connected with mining, the suggestion being made that only models or drawings of heavy machinery, motors and boilers be sent. The space needed will be given to exhibitors who apply for it before January 1, 1894, and motive power will be supplied. The freight on exhibits from Europe or the United States will also, it is understood, be paid by the Chilean Government. The exposition will close on April 30, 1894.

A combination of all the street railways of San Francisco is announced, with a capital stock of over \$18,000,000, the greater portion of which is understood to be owned by the Southern Pacific Company.

Professor Bland of Vermont University is making experiments with the view of converting culm into a fertilizer.

The substitution of electricity for cable power is being considered for the Brooklyn Bridge railroad.

The great coal strike in England, which began on July 28, is practically over, a large majority of the striking miners having resumed work.

Co-operation has, says the *Mining and Scientific Press* of San Francisco, Cal., been successfully adopted as the method for starting several of the idle mines at Leadville, Col. The Maid of Erin has set the example, and others are expected to follow. The plan whereby the resumption took place was an agreement between the men and the management to deduct the expenses of operating from the gross receipts and divide the net profits on a percentage mutually satisfactory. Between 50 and 100 men went to work on the first day, and should the scheme prove successful the force will be largely increased, and many idle men thus be employed.

Representative Caminetti of California has introduced in the House a bill to provide for the establishment of a gun factory for the finishing and assembling of heavy ordnance at Benicia, Cal., at the cost of \$1,000,000.

Ground was broken on October 12 for the new Bourse Building in Philadelphia. The work will, it is said, be vigorously pushed, and the building is expected to be well under way by spring.

Canada's mercantile fleet on the registry books last year numbered 7007, with a tonnage of 964,129, a decrease in the year of 84,364 tons.

A notable exodus of Hungarians from Pennsylvania has occurred during the past two months. At least 7000 laborers of that nationality are reported as having left the State, owing to the poor labor market. Most of them have returned to their own country.

The Hamburg American Packet Company have made contracts for the construction of five large twin-screw steamers for Transatlantic service. Three of the new steamers will be built at Belfast, and the other two at Stettin and Hamburg respectively. They will each be of 7800 tons and 465 feet in length, and will have a very large

freight capacity. When these five steamers are completed, the Hamburg-American line will own the second largest tonnage in the world, being less than that of the Peninsular and Oriental Company only.

Recent troubles in Central and South American republics have caused an active drain on our naval resources for war vessels for the protection of United States interests in the disturbed quarters.

One outcome of the recent financial stringency in New York City is noted in an almost complete cessation of speculative building during the past few months. Real estate journals regard this as a not unmixed evil, as the demand for houses is said to be rapidly catching up to the supply, causing greater steadiness in the market. The concomitant lack of employment is, however, pressing hardly on workmen in the building trades.

Incoming vessels report an unusual crop of derelicts in the Atlantic, many of which are in the direct path of the ocean liners. Twenty of these obstructions were recently reported to the Hydrographic Department in various positions off the coast from Maine to Florida, and the dynamite cruiser "Vesuvius" was sent last week on a mission of destruction toward those floating off the Jersey shore. It is probable that another naval vessel will be detailed to remove the derelicts since located, the number of which is said to have been augmented by last Friday's storm.

It is said that Secretary Herbert does not think that the Holland submarine boat, selected by the expert board, fulfills all the requirements sufficiently fully to justify him in expending \$150,000 in constructing and experimenting with a boat of this type. The Secretary believes it will be better to wait awhile before building a submarine vessel, so that time may be allowed for the development of a thoroughly trustworthy one.

Immigration statistics for the port of New York for the month of September show a decided falling off in the number of immigrants, particularly from Italy and Poland. The number of alien steerage passengers landed was 21,797.

The contract for building the much talked of Syrian railroad from Haifa to Damascus has been awarded to a Chicago firm, Huss & Townsend. Work is to be begun immediately. The enterprise has been initiated by English capitalists, who purpose ultimately extending the road to India if Persian concessions can be obtained.

After exhaustive experiments in New York harbor with the torpedo boat "Cushing" to determine the best color to paint such boats in order to escape detection by search lights, it was found that a dull green hue rendered the boat almost indistinguishable from the water. A recommendation is to be made to the Navy Department that all torpedo boats should be of this color.

The situation of the unemployed miners on the Gogebic range is reported by Western papers to be becoming serious. Bread riots have already occurred in several towns, and further disturbances are feared. Efforts are meanwhile being made to relieve the distress by raising money to feed the men and their families, as no present prospect of employment can be held out to them.

The Iron Age

New York, Thursday, October 19, 1893.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - BUSINESS MANAGER.

Disposition of Machinery Exhibits.

Considerable interest is manifested in the probable disposition of machinery exhibits at the close of the World's Fair. Some of this is due to the effort recently made by a prominent machinery house to sell at auction a large stock of machine tools, including those in their exhibit at the fair. It is evidently thought that this may be an example which will be followed by others. Those who are looking for bargains in the machinery line are presumably hoping that this will be the case. The auction sale alluded to, however, was not a success. The number of machines disposed of fell far short of expectations, while the prices realized fell still shorter. It is stated that few of them brought two-thirds of the very lowest discount previously allowed, while some sold down to, if not below, half price. Such results are rather discouraging to the growth of auction sales in the machinery trade. Had the one just tried proved fairly successful, others, perhaps, might have followed. It is now likely that no one will care to venture a repetition of the experiment. Careful inquiry fails to disclose any prospect of such sales taking place among the exhibitors of machinery at the fair. It is true that one manufacturer of wood working machinery is offering his machines, according to conspicuously posted signs, at an "enormous discount," but not even his example is being followed, so far as can be ascertained.

Many exhibitors state that they have sold duplicates of machines exhibited, and that they may at the close of the fair decide to ship direct to such purchasers from the exhibit. But this cannot be so satisfactorily done at the fair as at the home shops, because it may be necessary to pack certain parts much more carefully than would be done for merely shipping from the fair to the shops. This is especially the case with sales for export, which have latterly become quite a feature in the machinery section. There are some portions of machines destined for such shipment that will be carefully soldered in tin packages to insure their receipt in good order, free from rust or other deterioration. Makers of ponderous machinery, and perhaps others, are willing to take reasonable reductions on regular prices, which would offset the expense of shipment back to the shops, but there is little apparent disposition to make any sacrifice in the value of standard machines merely to

get rid of them. Exhibitors who have had previous experience at large fairs say that those who try the experiment of storing machinery in Chicago in the hope of selling it in the course of time will find that they have made a blunder. In much better times than these machines have been stored in the hope of an early sale, but disappointment followed in the majority of cases. Concerns having regular warehouses in Chicago, with agents to carefully look after their special interests, are of course in a position to pursue a different policy. Their machines will be transferred to the Chicago warehouses as a matter of regular business.

A number of exhibitors interviewed appear to be in no hurry to make any definite arrangements for the disposal of their machines, but will let circumstances govern them. Such machines as can easily be removed to the shops will be shipped as soon as convenient after the fair closes. Those of which there is some reasonable hope that they may be sold will be permitted to stand for a time. As the buildings will not be torn down this winter, such machines can be "doped" and will then pass through the winter without injury, and can be removed in the spring when the rush of shipping exhibits will be over. The transportation facilities, however, are vastly superior to what they were last winter and spring when installations were made, and those who are in a hurry to get their exhibits back to their shops will not experience much delay or inconvenience on that account.

Professor Reuleaux's Chicago Speech.

A casual utterance of *The Iron Age*, innocent in intent, and growing out of a misapprehension, has created a great hubbub on the other side of the Atlantic. It has, we regret to state, done great injury to one whom Americans justly honor, and who has in the past done signal service by timely and frank criticism to the manufacturing and art industry of his own country. At the meeting of the World's Engineering Congress Professor Reuleaux was called upon, unexpectedly to him, to address his fellow engineers. One sentence in this extemporaneous speech was misinterpreted by us as implying an acknowledgment by him that American workmen had attained greater precision as mechanics than their German fellows. In justice to Professor Reuleaux we print below the full text of that part of his remarks dealing with the subject, from the stenographer's official record:

Should I be allowed to mention some points on the mechanical exposition, to which my own profession goes directly, I should say that I was astonished on one point in the most striking way. It was the development of exact measuring. That precise measure method has been developed through America in such an astonishing way that we are always struck by it. Your workmen are already accustomed to measure by the thousandth of an inch, we have begun only to do so. In the United States

you will find instruments in nearly every hardware shop for such measurements, and especially on the part of scientific engineering; this is giving you, and will further on give you, a great advantage over all others who do not work so. I dare say we have begun in Germany and in France and England to follow you, but we are the followers and you are the leaders until now. So I could find a great many points in the mechanical exhibition of this exposition which are in advance, and so I see the Americans now going on to lead the progress of mechanical engineering, and I have been thankful to have been able to see them, and to be able to congratulate American friends and engineers.

From a more detailed elaboration of Professor Reuleaux's position which he then desired to present to his audience, and to which he still adheres, we understand it now to be this: In this country the system of depending upon precise measuring as the fundamental basis of manufacturing operations in certain lines of work has developed rapidly, and while Europeans are following, further progress in that direction is still being made in this country, keeping us in the van. As an illustration of how widespread that system is Professor Reuleaux instanced the fact that the necessary instruments are in the hands of every mechanic. He dealt with the system, he did not mean to draw any comparisons between the ability of mechanics of different countries to employ tools for fine measurement.

We believe that in the light of this statement Professor Reuleaux will be pronounced innocent of any effort to disparage the abilities of the workmen of his own country. We must confess that the violent outburst of patriotic indignation which the German press has indulged in is somewhat incomprehensible to us. We trust that those who were so eager to assail Professor Reuleux will be animated by the same fair spirit of seeing justice done which has made us anxious to acknowledge that we misunderstood his remarks and drew from them inferences which we now know were far from his thoughts.

The Iron and Steel Institute Meeting.

On the whole, the expectations raised by the announcement of the proceedings of the Darlington meeting of the Iron and Steel Institute have not been realized. The first paper read was that of the famous Austrian metallurgist, Paul Kupelweiser, which was not put before the Institute at its last gathering. We commented on it at the time, regarding it as one of the most important contributions of recent years. It is possible that the Witkowitz duplex process has not that interest for English metallurgists which it possesses particularly for those who are striving and hoping to establish a steel industry in our Southern States. The works which Paul Kupelweiser conducted until recently are the only establishment in which pig iron is taken direct from the blast furnace to Bessemer converters, where

it is desiliconized and is then poured into a basic open hearth furnace. Since that has been the favorite method proposed by Southern metallurgists, the success at Witkowitz has been very encouraging. The remarks and criticisms of James Riley of the Steel Company of Scotland in the discussion of the paper were evidently from the narrower standpoint of availability of the duplex process for conditions prevailing in England. We are inclined to believe that from a commercial point of view Mr. Riley's position is correct. The technical results, however, seem to us to have been belittled in vain. The achievements at Witkowitz prove that the duplex process can be carried through successfully. It remains to be seen, of course, whether commercially the South can meet the competition of soft steel produced from lake ores at points west of the Alleghenies or made in the Eastern territory from local and foreign raw material.

Sir Lowthian Bell has contributed a paper on "The Waste of Heat (Past, Present and Future) in Smelting Ores of Iron," in which he develops an interesting analysis of the heat balance sheet, if it may be so termed, of the blast furnace. Sir Lowthian Bell does not appear to hope for much gain in the direction of higher blast temperatures, or the better utilization of the heat in the gases in the hot blast stoves or under the boilers. He has turned to the employment of the sensible heat in the cinder produced and that in the exhaust steam from the engines. He has experimented without accumulating any large array of data thus far, with turning the exhaust steam into chambers in which the cinder is allowed to cool and then availing himself of the heated steam thus obtained to evaporate brine.

Professor Ledebur's paper on "The Modifications of Carbon in Iron" is a good summary of the present status of research into that somewhat abstruse subject in which developments may soon attain a point where their practical utility to the producer and the consumer of steel become apparent.

We confess to some disappointment at the paper presented by J. P. Bedson, on "Iron and Steel Wire and the Development of its Manufacture." It is very largely historical and does not refer to the very latest work done. It is only fair to state, however, that Mr. Bedson promises to give some data later on concerning the new works which he is building for the Bedson Wire Company, at Middlesborough.

To rolling mill managers in America the most interesting but at the same time puzzling paper is that of William Muirhead on "Suggested Improvements in the Manufacture of Steel Plates." Mr. Muirhead was encouraged by his success in rolling angles, bulbs and bars, to propose a similar method for plates. So far as we can understand the plan without the drawings which accompany the paper, Mr. Muirhead does his blooming on one train

driven by a direct coupled high speed engine and finishes without reheating on a second train. This is what he intends to adopt also for plate rolling, the main object being to get rid of the reheating of the slab.

The Closing Month of the Fair.

The World's Fair is winding up its career in a blaze of glory. As Chicago surprised the world with the grandeur of its exposition buildings, and as the magnificence of the display in its entirety far surpassed anything previously accomplished in the same line, so has the attendance outrun all expectations, and in that respect another phenomenal triumph has been scored. High water mark was struck on the 9th inst., "Chicago Day," when the total attendance reached 761,942 including those admitted on passes, or 716,881 paid admissions. Several days in the same week the paid attendance ran above 250,000 and on two days it was over 300,000. The total paid attendance for the week, including Sunday, the 8th, was 2,131,719. This far outnumbers the attendance in any similar period at any previous international or any other kind of exposition, or, in fact, any other kind of gathering of which there is any authentic record. A figure is thus set for the future that will be very difficult to exceed, and it is safe to say that for years to come any very great gathering of people will be compared with this stupendous occurrence in Chicago on the 9th of October, 1893. The attendance at the exposition for the week is another most notable matter. The figures are staggering. But Chicago boasts not alone of this achievement in attendance. To the surprise of many shrewd businessmen, who had not looked for such success, the exposition managers signalized Chicago Day by paying off the floating debt and the mortgage on the gate receipts, thus leaving the enterprise free of all obligations to any persons but the stockholders, who may now reasonably expect a dividend in due season. The check drawn on this memorable occasion for the payment of the trustee of the several classes of creditors called for \$1,565,310.76. Thus has Chicago gloriously redeemed the obligations incurred when she assumed the task of building a World's Fair. Chicago's business men started out to prepare for a finer, bigger and more successful enterprise than the world had ever seen in this line. The verdict of the jury of the nations of the earth who have seen it is that it is unquestionably bigger and undoubtedly finer, and now it is assuredly more successful. Great is Chicago, and we are prouder than ever of her.

Among those who will lecture before the Franklin Institute of Philadelphia during the coming season will be Henry R. Towne of Stamford, Conn., who will speak, on January 26, on "American Bank Locks and Fastenings."

CORRESPONDENCE.

Foreign Labor Pests.

To the Editor: The Riverside Iron Works of Wheeling, W. Va., have set an example in dealing with obnoxious foreign laborers which many managers and superintendents will hope that their companies will soon be able to follow. They have summarily discharged from their employment all Italians, Poles and other common laborers who represent Europe's worst element, and hereafter will employ only good citizens. This action was the result of riot and disturbance in which these labor pests indulged a few weeks ago; and it will cause exultation among all who have ever had dealings with this class of workmen. Following the action of the Riverside Company, blast furnace proprietors, rolling mill operators, the Pittsburgh & Lake Erie Railroad Company, and other employees of common labor at New Castle, Pa., have taken a decided stand against the employment of such labor, and there has been a general exodus of undesirable foreigners to their native shores or to other parts of the United States where they are still tolerated.

Only those who have had laborers of this class under their charge can fully realize how difficult it is to deal with them. They are capable of exasperating any one with whom they come in contact. When seeking employment they are submissive and servile, but after they have secured it their dumb insolence is unbearable. They are cunning as foxes, and will never understand except when it suits their convenience, and their vocabulary of English is never used except when there is an imaginary or real shortage in their pay or they think that an opportune time has arrived to raise a disturbance. If furnaces, mills or coke ovens are shut down and they are temporarily thrown out of employment, they do not spend any part of their savings, but live by committing depredations among farmers and others. They will shirk their work and do only the bidding of a taskmaster who speaks their language and is too often the recipient of a commission from their wages. Their appreciation of a labor situation is keen, and troubles among them always rise like a volcano. In the language of one of their number who tries to hide his disgust under cover of a plea of extenuation for his more ignorant brethren, "If each Italian would try to become a good, naturalized citizen the prejudice against them would die out." It is doubtful, however, if this would make the average Italian or Polish laborer tolerable. They are a source of continual annoyance, always getting into lawsuits, fighting among themselves and a constant menace to peace wherever they are gathered in numbers. Taken altogether, they have not a redeeming trait, as a body, no matter what virtues individuals may possess, and the employer who lends his assistance toward ridding the labor world of this disturbing element will be entitled to the thanks of all concerned, and will afford opportunities for securing employment to good, honest, peaceable workmen, whose citizenship will be a credit to the country. B. D.

Prof. Sylvanus Thompson of London believes that ocean telephony is not only possible, but that it will be among the developments of the near future.

Lake Superior Mines.

Along the Lake Superior mining district has there been not even the semblance of increasing activity that the daily press has given the iron workers' trade. The situation has steadily gone from bad to worse ever since the general shut down in July. Even the phenomenal activity in shipping from the Mesaba is a sign of quiet for the older ranges not only for this fall, but the early part of next year at least, for most of the Mesaba ore now going forward in such quantity is unsold and will lie on Cleveland and Lake Erie docks until such time as there is a better demand. The startlingly large decrease of furnace work does not augur well for activity for the ore trade for a long time to come.

By ranges the situation is about as follows: On the Menominee and Marquette ranges, where 57 mines produced ore last year, only about a dozen are at work, and those not actively or extensively. Less than 1000 men are at work on the Menominee, where a year ago there were 3000 or more. In the Crystal Falls section of the Menominee not a single mine or prospect is busy. The Chapin Mine, which had achieved a production up to last fall third in rank in the entire country, has lifted its pumps and abandoned operations for the present at least. Three of the large mines of the Marquette range have lately been added to the same list of flooded properties. Ore shipments for the year from both these ranges are about over.

On the Gogebic range only enough ore will now be sent to shipping ports to load vessels now on the way or under charter. A year ago 15 mines were shipping to Ashland and the week's forwarding was 75,380 tons. This week only one mine is shipping and the weekly report is scarcely worth mention. Last week the total shipped was 17,459 tons. A year ago Ashland shipments had been 1,966,000 tons for the season. To date this year they have been 1,015,000 tons. Total Gogebic range shipments to the lower lakes last year were 2,974,000 tons. This year they will not equal half that. Several of the better mines here also are filled with water.

On the Vermillion range, at the Minnesota Iron Company's mines, where 2500 or more men are employed in prosperous times, there are only half a dozen underground carpenters, and less than 200 on the surface, stock pile men. It is generally believed that even this trifling force will be idle November 1. At the Chandler there are none but stock pile men, and only a score or two of them. The Pioneer is idle and is flooded. The Zenith has shipped its stock pile and stopped all operations. There are no other productive mines on the range.

On the Mesaba the Biwabik, Oliver, Commodore, Franklin and Mountain Iron are working. Were it not for the cheapest mining and the money of a very heavy syndicate furnished to allow ore to be held on Lake Erie docks and the desire to get as much of the new ore as possible to furnaces, several of these would be idle. The Commodore will shut down in a few days. The range will ship about 500,000 tons for the season, not nearly as much as was expected last season, but certainly a good total for a new district.

That there isn't much consolation in this review of the situation goes without saying.

The Mesaba has made some steam shovel mining records the last week that are interesting and exceedingly important as showing what the range can do. At the Biwabik are shoveled, mined and loaded on cars, 85 cars, or 1950 tons, in nine hours. This is at the continuous rate of nearly 4 tons per minute for the entire time. Other records made in the past two weeks have been, at the Oliver, 1500 tons in seven hours; at the Mountain Iron, 1700 in nine hours; at the Biwabik, 3400 in 20 hours. It is expected that the Hale will resume shipping in a short time. Very extensive operations will be carried on by the Biwabik, Commodore, Franklin and by several of the consolidated mines during the winter, among the latter particularly at the Rathbun and Adams, which will each be stripped for steam shovel mining.

The total ore shipments from Lake Superior, including all the mines in the region except those shipping via Escanaba, on Lake Michigan, up to and including October 12, were 4,100,000 tons. Escanaba shipments have probably not been to exceed 1,000,000 tons more. For the entire year there may be sent forward from the mines as high as 5,500,000 tons, against a total of 9,074,000 tons in 1892 and an average of over 8,000,000 tons for the past four years.

OBITUARY.

DENNIS LONG.

Dennis Long, founder of the well-known pipe making firm of Dennis Long & Co. of Louisville, Ky., died at his residence in that city on the 8th inst., after a short sickness. Mr. Long was born in Londonderry, Ireland, in 1816. At the age of four years he came to America with his parents, the family settling at Erie, Pa. A few years later they moved to Pittsburgh, where Mr. Long served his apprenticeship as a molder. His first journey work was performed in Louisville, to which place he went over 50 years ago. Of an industrious and saving turn of mind, he soon saved enough money to start a foundry and machine shop of his own. His principal business at first was done with the steamboats on the Ohio river, the river traffic at that time being one of the chief revenues of business of Louisville. The first pipes for the St. Louis, Mo., gas works and the first large water pipes for the city of Nashville were made by Mr. Long. About this time Bryan Roach became associated with Mr. Long, and the firm enlarged their capacity under the firm name of Roach & Long. In 1860 Mr. Roach died, and the business from that time on was conducted by Mr. Long, the corporation of Dennis Long & Co. being formed later on. He also built and run for a number of years pipe works in Columbus, Ohio, and Chicago. Mr. Long was particularly unfortunate in suffering loss from fire on four different occasions, one of the occasions being the burning of the large pipe works, entailing a loss of \$300,000. Some years ago the holding of a large amount of the then unsalable water company bonds of a distant company compelled Mr. Long to call his creditors together. He exhibited the state of his affairs to his creditors, who decided to act in accordance with any plan Mr. Long might himself suggest. He asked for an extension of time and gave his notes with interest at 6 per cent. Every note was faithfully paid in

three years' time and many of the notes were paid before maturing. At the time of his death Mr. Long was president of the corporation of Dennis Long & Co., president of the Louisville & Jeffersonville Bridge Company, and director in several companies and of various institutions. He leaves an estate valued at \$1,000,000.

BENJAMIN WHITWORTH.

English journals announce the death, on September 24, at his residence, Hampstead, near London, of Benjamin Whitworth, one of the foremost men in the coal and iron trade of England. Mr. Whitworth was born at Manchester in 1816, and as a young man joined with his brothers in the business of fustian manufacture. Subsequently he became connected with the coal and iron industries, and was one of the originators and first directors of the following well-known corporations: Bolckow, Vaughan & Co., Tredegar Coal & Iron Company, John Brown & Co. of Sheffield, Staveley Coal & Iron Company and Sheepbridge Coal & Iron Company. Mr. Whitworth was a man of wide sympathies and engaged in many philanthropic works, besides being a liberal giver of halls, libraries, water works and other useful public institutions to towns with which he was connected. He sat in the British Parliament as a Liberal for a number of years.

THOMAS HAWKESLEY, F.R.S.

Thomas Hawkesley, F.R.S., one of the best known civil engineers of the day, and a prominent member of the British Iron and Steel Institute, died in England, on September 23, at the age of 86, having retained his mental powers and his large professional practice to the last. Mr. Hawkesley stood for a long period at the head of his profession as an expert in that branch of it which relates to water and gas supply and to drainage and hydrants, having constructed over 150 water works all over the world, many of them of the largest character.

VALENTINE W. WEAVER.

Valentine W. Weaver, superintendent of the Macungie Furnace of the Crane Iron Company at Macungie, Pa., dropped dead at Catasaqua, October 11, of apoplexy. Deceased was born in Northampton County, Pa., in 1826. At the age of 20 he became an apprentice at the Crane Iron Works, Catasaqua, where he learned the trade of machinist. After several years he became assistant superintendent of the Thomas Iron Company, Hokendauqua, for whom he erected and managed the Lock Ridge Furnaces, at Alburis. He also superintended the erection of the Macungie Furnace. In 1879 Mr. Weaver moved to Coplay, Pa., as superintendent of the Coplay Iron Company's works, where he remained several years. Later he removed to Macungie and assumed the superintendency of the Macungie Furnace. Mr. Weaver was a director in the Catasaqua Mfg. Company, a stockholder of the Thomas Iron Company and a director in the Catasaqua and Slatington banks.

DANIEL WOLF.

Daniel Wolf, of the well-known firm of Hillebrand & Wolf, proprietors of the Star Lock Works, Philadelphia, died on Friday evening, September 29. Mr. Wolf was born in Rhenish Bavaria, and came to this country in 1846, and in 1867 formed a partnership with Mr. Hillebrand, which continued uninter-

ruptedly and successfully up to the day of his death. The deceased was of a quiet, unassuming disposition, but of excellent business qualifications, and was highly respected by the firm's numerous employees and by all who had the pleasure of his acquaintance. The business will be carried on by Mr. Hillebrand, under the old firm name of Hillebrand & Wolf, the Star Lock Works.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., October 17, 1893.

Commodore William T. Sampson, Chief of the Bureau of Ordnance, U. S. Navy, converses very interestingly upon the subject of naval ordnance and what has been accomplished by the Government of the United States. The Commodore is not only an experienced seaman, but an expert in ordnance. He commanded the "San Francisco," one of the finest of the new ships of the navy; was on duty at the torpedo station, and later Inspector of Ordnance at the Washington Gun Foundry, from which position he was promoted to his present important duty as Chief of Bureau. Commodore Sampson has completed his annual report, which will be ready in a few days. In taking a conversational retrospect of the year, he said:

The experiments in the different classes of armor plate were completed a year ago. These comprised tests of high and low carbon nickel steel, low carbon steel and nickel steel Harvey. The results of those experiments have been amply sustained by the tests of lots of armor for the different ships under construction during the past year. We now use nothing but Harvey plates for the armor of our vessels. They are undoubtedly the best plates made, not only in this but in any country.

As a matter of comparison the following shows the official results of the experiments, which have been borne out by subsequent tests:

Character of plate.	Maker.	Weight, pounds.	Total bolt cross section per ton of plate, sq. inches.
High carbon nickel-steel.....	B. I. Co.	20,494	5.71
Low carbon nickel-steel.....	C. P. & Co.	20,844	5.62
Low carbon steel Harvey.....	B. I. Co.	20,506	5.71
High carbon nickel-steel.....	C. P. & Co.	20,590	5.69
Low carbon nickel-steel Harvey.....	C. P. & Co.	20,220	5.79
High carbon nickel-steel Harvey.....	B. I. Co.	20,682	5.66

The plates, 8 feet by 6 feet by 10 feet 5 inches, were fastened by 12 bolts 2.36 inches in diameter, giving a total cross section of 52.29 square inches. The targets were set up so that the faces of the plate were on the chords of a circle whose center was the gun's pivot and whose radius was 73 feet 5 inches. The muzzle of the 6-inch B. L. R. was 57 feet 5 inches and the 8-inch gun 55 feet 5 inches from the face of the plate, the axis of the gun being then perpendicular to the plane of the plate.

The tests of plates this year have been for the "Indiana," "Massachusetts" and "Oregon," battle ships, and "Maine" and "Texas," armored cruisers. These plates have run up to 17 inches in thickness, and in every case have been successful.

We anticipate no trouble in working the high grade of plates we are now using on our battle ships. The work must be done on the plates; that is, the bolt holes put in before the plates are Harveyed. This will put a stop to a practice which is of doubtful expediency. Bolts are put in to hold the plates, and sometimes a row of them across the plates, which must necessarily weaken them. The bolt holes must now be located first and inspected, after which the plates can be Harveyed.

There will be no trouble in working the plates in this manner, and we will secure better results.

The work on the hulls of the ships is far ahead of the supply of armor. Here is a table which shows how we stand on that important subject:

Summary of Armor Contracts (to October 1, 1893).

Vessels.	Amount required and ordered—Tons.			Amount delivered to October 1, 1893.	
	Bethlehem.	Carnegie.	Total.	Bethlehem.	Carnegie.
Amphitrite.....	311.23	359.39	670.62	172.74	259.39
Monadnock.....	145.29	504.80	650.09	8.71	168.49
Terror.....	337.99	298.66	636.65	312.36	151.83
Puritan.....	978.19	118.58	1,094.77	281.04	
Texas.....	1,025.52		1,025.52	703.85	
Maine.....	1,172.31		1,172.31	506.17	
Monterey.....	160.64		160.64	160.64	
Ram.....		546.62	546.62		546.62
New York.....		768.17	768.17		112.10
Oregon.....		538.46	538.46		538.46
Massachusetts.....	710.19	2,002.40	2,712.59	254.15	331.69
Indiana.....	2,164.21	552.36	2,716.57	265.09	183.43
Olympia.....	2,337.66	384.63	2,722.29	1,216.52	179.67
Cincinnati.....		224.25	224.25		150.51
Raleigh.....		48.40	48.40		48.40
Montgomery.....		47.49	47.49		47.49
Detroit.....		22.20	22.20		22.20
Marblehead.....		21.86	21.86		21.86
Columbia.....		20.41	20.41		20.41
Minneapolis.....		77.11	77.11		77.11
Machias.....		19.23	19.23		26.56
Castine.....		21.17	21.17		4.34
Iowa.....		21.21	21.21		21.21
Brooklyn.....	906.19	1,721.28	2,627.47		
Gunboat No. 7.....	113.86	578.62	692.48		
Gunboat No. 8.....			17.00		
Gunboat No. 9.....			14.00		
Totals.....	10,361.48	8,967.30	19,373.78	3,881.27	3,011.77

Each nation claims a special merit for its own arm, but the Creusot is regarded as the best of foreign plates. This is made of steel of a high grade. But I have no hesitation in saying that a comparison of results of tests shows that we are in the lead. The nickel armor plate can be produced cheaper here than abroad. Many inquiries from expert sources abroad are being made concerning our wonderful nickel plate armor. The simple steel is almost certain to crack. The nickel plate is tougher and can better resist battering by the formidable armor piercing projectiles we have in these days and made in the United States.

I think our superiority in plate is being reluctantly conceded from abroad, and, being able to manufacture it cheaper here than there, it may open a new and valuable trade.

In reference to guns we are going ahead in the same line. We are making no change, but turning out guns of our own designs as rapidly as possible to meet the demand of the ships as they are required. We can now keep pace with the requirements of the ships as they are completed ready for their armament of high power B. L. guns.

We claim for our guns that they sur-

pass the finest in the world. This many experts admit, and, we think, others will be compelled to as their work becomes better known. Our guns will stand a pressure of 32 tons to the square inch. This is 7 tons more than is required by the rules laid down by the Department. The 18-inch gun is the largest we are making at present. That is an effective gun for the best results in rapidity of handling and destructive power.

All carriages are of the Department designing. They are controlled by hydraulic power. Experiments are in progress in the application of electricity. This is now being experimented with in revolving the turrets. I have no doubt it will be applied to other uses about heavy guns. There is now a system of supplying guns by means of electricity.

The Krupp 110-ton gun is 16 inches, but a gun too large to be readily handled become really ineffective. Smaller guns quickly and more accurately handled are better. The most

important tests which are now being made are with projectiles fired at an inclination. We find in this severe trial the projectiles are badly broken. When fired vertically to the plane of the plate they turn out all right, because in this case the parts of the projectile are supported, but fired at an inclination each part must depend upon itself. The result is as stated. We will continue our experiments in this line.

A meeting of the Association of Iron and Steel Sheet Manufacturers was held at their headquarters, in the Times Building, Pittsburgh, last week. The wage scale question was up for discussion and it was decided to postpone action until the vote now being taken by the lodges of the Amalgamated Association on the question of agreeing to a 10 per cent. reduction has been completed. As soon as the result of the vote is known another meeting of the association will be held to take suitable action.

Two natural gas wells have been tapped recently near Ballston, N. Y., and further drilling is in progress.

MANUFACTURING.

Iron and Steel.

Last week test operations were commenced at the new plant of the New Castle Steel & Tin Plate Company, New Castle, Pa. Only black plates were made, the tinning department not being completed. The result gave perfect satisfaction, plates produced being pronounced by experts equal in finish to any foreign make.

The partnership heretofore existing under the firm name of N. D. Doxey & Co., wherein N. D. Doxey of Elmira, N. Y.; Benjamin Maurice of Athens, Pa., and Charles J. Root of Elmira, N. Y., were partners, has been dissolved by mutual consent, Benjamin Maurice retiring. The Elmira Iron & Steel Rolling Mills will hereafter be operated by N. D. Doxey and Chas. J. Root, under the title of N. D. Doxey & Co. Messrs. Doxey and Root have long been identified with these mills, and will continue to produce plates, angles and merchant bar iron.

A petition has been filed in the Circuit Court at New Albany, Ind., praying that a receiver be appointed for the New Albany Forge & Rolling Mill Company. The petitioners are holders of \$50,000 of the first mortgage bonds issued by the company and secured by a lien on the plant.

After a shut down of two weeks the sheet mill of Summers Bros. & Co., at Struthers, Ohio, is again in operation.

Sarah Furnace of the Kelly Nail & Iron Company, at Ironton, Ohio, has resumed operations.

Frank L. Froment, iron and steel commission merchant, at Nos. 446 West and 161 and 163 Bank streets, New York, has made an assignment to Wylie H. Vilas, giving a preference to Mary E. Bacon of Boston for \$10,000 borrowed money. He was the principal owner of the Blandon Iron & Steel Company of Blandon, Pa., who failed two years ago, and was also for several years president of the New York & Perry Coal & Iron Company of Shawnee and Straitsville, Ohio.

It is now announced that a settlement has finally been made between the Salem Wire Nail Company, Salem, Ohio, and their wire drawers. At one time it seemed as though a prolonged strike would result, but the men have concluded to accept a reduction of 10 per cent. Vice-President McEvey of the Amalgamated Association was instrumental in bringing about the agreement. It is understood that this settlement affects the Findlay, Ohio, mill also operated by this company.

The Union Iron & Steel Company of Youngstown, Ohio, have discharged their entire force with the exception of two men. In explanation of this action an official of the firm states that it was taken for the reason that it is very uncertain when operations will be resumed in any of the various mills of the firm.

Belfont Furnace of the Belfont Iron Works Company, at Ironton, Ohio, resumed operations last week.

The Carnegie Steel Company, Limited, have recently purchased 22 lots with a river frontage of 650 feet situated adjacent to the Homestead Steel Works, at Homestead, Pa.

The Monongahela Furnace of the Monongahela Furnace Company, McKeesport, Pa., which has been banked down for several months, will resume operations during this week. These two furnaces each turn out about 250 tons of iron every 24 hours.

The personal property of the Columbia Iron & Steel Company, at Uniontown, Pa., was sold last week at sheriff's sale. The sale was brought about by executions amounting to \$120,000, entered by Robert Hogsett, president of the firm, and the People's Bank of Uniontown. The most of the property was bought in by James A. A. Seabright, a director of the firm.

The Youngstown Bridge Company, Youngstown, Ohio, have the contract to supply the material for a tubular iron bridge, now under construction at Quincy, Ill., and which will cost \$40,000.

The Falcon Iron & Nail Company, Niles, Ohio, have notified their employees of a 10 per cent. reduction in wages to take effect at once. This applies to all workmen except

those whose wages are governed by the Amalgamated Association scale.

The Muncie Nail Company of Muncie, Ind., went into the hands of a receiver last week.

A number of puddling furnaces in the plant of the Clinton Iron & Steel Company, at Pittsburgh, Pa., were started up last week with non-union men, the price for puddling being set at \$4 per ton. The firm state that so far they have had no trouble in securing competent men as fast as they could use them.

Last week notices were posted at the Edgar Thomson Steel Works, Bessemer, Pa., announcing that operations would be resumed in all departments on Monday morning, the 16th inst., at 6 o'clock. During last week the wages of some of the tonnage men were slightly reduced in order to have them conform more closely to wages paid for the same kind of labor at the Homestead Steel Works and other plants.

The Lockhart Iron & Steel Company, operating the Vulcan Forge & Iron Works, at Chartiers, Pittsburgh, have their muck and guide mills on double turn, while the bar mill is on single turn.

George B. Lessig, chairman of the Ellis & Lessig Steel & Iron Company, Limited, of Pottstown, Pa., at a meeting of the striking puddlers, made them two propositions. The first was to pay them \$2.75 per ton, with small chance of steady work, and the second was to pay \$2.50 per ton and guarantee them at least 15 days' work each month during the coming winter. We are advised that the men decided to accept the latter and will resume work on Monday.

Machinery.

The Jeffrey Mfg. Company, 143 Washington street, New York, and Columbus, Ohio, are installing an entire new plant for the Rumford Falls Paper Company, Rumford, Maine, from start to finish, for the economical hauling of logs from the river some hundreds of feet to a suitable place convenient to the mill, to be used as wanted. One of the objects is to provide a reserve for use in winter when the adjacent river freezes solid, although provided for the quick handling of logs at any time.

Among the sales recently made of the Stirling water tube safety boiler are the following: Adriance Platt & Co., Poughkeepsie, N. Y., manufacturers of Buckeye mowers and reapers, 250 horse-power; Simpson & Watkins, Scranton, Pa., three boilers (second order), 300 horse-power, and Lutz, Lilly & Co., Philadelphia, Pa. (second order), 250 horse-power. In the West Farms station of the Union Railway Company, New York City, 500 horse-power has recently been put into service and an additional 500 horse power ordered.

The Flemington Iron Foundry, at Flemington, N. J., has started up with a full force after nine months of idleness.

Smith & Hall, dealers in engines, boilers and general machinery at Macon, Ga., have made an assignment. The liabilities are estimated at about \$25,000 and the assets at \$20,000. The failure is attributed to dull trade.

The Tonkin Boiler & Engine Works, at Oswego, N. Y., have been completed and operations will begin at once.

W. F. & John Barnes Company of Rockford, Ill., manufacturers of machinery and mechanics' tools and supplies, report a material increase in orders and a much better inquiry for prices, indicating that, despite the delay at Washington, business is assuming a firmer tone. The company have been operating their plant with a force equivalent to one-half on full time; but during the past two weeks have put more men at work, and will continue to increase their force as business warrants.

H. H. Buzzell & Son are about to start a brass foundry at Laconia, N. H.

D. J. Bolenger's Foundry, at Waynesburg, Ohio, has been burned. Loss, \$5000; insurance, \$500.

The Ferracute Machine Company of Bridgeton, N. J., manufacturers of presses, dies and other sheet metal tools, have kept their works running during the entire summer with a part of their force. Orders are now coming in much better than a month ago, and trade prospects seem much brighter.

The works of the Birdsall Company, manufacturers of steam engines grain

threshers and portable sawmills, at Auburn, N. Y., have been closed by the sheriff on an execution of \$165,000. The judgment was in favor of Henry H. Cook of New York City, and is for money loaned to the concern. An hour after the judgment was filed a chattel mortgage for \$75,000 in favor of H. H. Cook and Nelson Beardsley was filed.

Aultman, Miller & Co., mower and reaper manufacturers, of Akron, Ohio, have just completed the erection of a new foundry. The building is 400 x 100 feet in size, the molding room being 300 x 100. The remaining 100 feet of length is taken up with pattern rooms, core rooms, &c. The cupola is of the Whiting design, furnished by the Detroit Foundry Equipment Company of Detroit, Mich. For heating and ventilating the Sturtevant system is used, put in by E. H. Jones & Co. of Cleveland, Ohio. It is probable that this new foundry will be put in operation during this month.

The Enterprise Machine Company of Elyria, Ohio, have been chartered, with a capital stock of \$10,000, for the purpose of manufacturing and selling all kinds of machinery and conducting a general foundry business.

The Pittsburgh Gauge Company of Pittsburgh recently received an order from the United States Government for a number of special safety water columns of phosphor bronze, nickel plated and polished, with water gauges and gauge cocks. These will be placed in the Treasury Building at Washington.

The Glover Foundry Company, Limited, New Castle, Pa., advise us that they have recently received some fairly large orders for annealing boxes, housings and chilled rolls.

The Stillwell-Bierce & Smith-Vaile Company of Dayton, Ohio, have declared a dividend of 2 per cent. on the preferred stock, payable October 16.

The Cowles Engineering Company, which did a large business at 43d street and the East River, Brooklyn, N. Y., has failed. Vaulx Carter is the assignee. The company were incorporated three years ago to design, build, repair and alter steam engines and boilers. William Cowles, formerly a mechanical engineer and draftsman in the Navy Yard, is president of the company. The assignee was the treasurer. The company built the fireboat David A. Boody for Brooklyn, and two other fireboats. Among the creditors are Nathanael F. Bacon of Syracuse, \$130,000; R. Hazard, Rhode Island, \$9,500; Thomas F. Nevins, Brooklyn, \$1,470; First National Bank, Syracuse, \$6,000; E. F. Rice, Syracuse, \$7,025, and G. W. Schmidt, New York, \$1,000—all for money lent. Considerable amounts are owing to various firms and the workmen have not been paid \$1,800. There are seven attachments for \$30,000 in the Sheriff's hands against the company.

The Patapsco Iron Company, for the manufacture of metal castings and machinery, have been incorporated in Baltimore, Md., by Robert R. Zell and Wm. J. O'Brien, Jr.

Hardware.

The Northwestern Barb Wire Company, Rock Falls, Ill., commenced operations on a small scale on the 2d inst., and expect to put on their full force in the near future.

A cut down of 10 per cent. in all departments of the Concord Axle Works, Penacook, N. H., went into effect on the 9th inst.

Blenkhorn & Son's axe factory, at Canning, N. S., was destroyed by fire on the 29th ult. Loss, \$8000; insurance, \$1000.

The Eagle Lock Company, Terryville, Conn., have commenced to work on short time and until further notice will run only four days per week.

The shovel works of the Oliver Ames & Sons' Corporation, North Easton, Mass., are running but nine hours a day.

The Vermont Farm Machine Company, Bellows Falls, Vt., closed down on the 30th ult. for the annual inventory. Advantage will be made of the shut down to make needed repairs.

At the annual meeting of the stockholders of the Portland Screen Company, Portland, Maine, the following persons were elected directors: W. S. Eaton, Wm. H. Stevens, F. A. Neal, Chas. W. Allen, Chas. J. Chapman, Fred. E. Haskell and Lewis A. Goudy. W. S. Eaton was elected president and Chas. R. Lewis treasurer. The reports of the officers showed that the company have earned a gratifying profit on

the business of the past year, and a dividend of 6 per cent. was declared.

The Ely Hoe & Fork Company, St. Johnsbury, Vt., have resumed operations, after spending about \$5000 on repairs to the works, putting in a new dam, &c.

The Western Screw Company, Chicago, Ill., have been incorporated, with a capital stock of \$100,000. The incorporators are Michael J. Dunne, John T. Boos and Frank M. Burwash.

The Canton works of the Cleveland Axle Mfg. Company, Cleveland, Ohio, have resumed operations with a force of 160 hands. It is expected that 200 will be employed by November.

Wellsboro, N. Y., is to have a new industry in the form of a lock factory. A stock company has been formed, with a capital of \$50,000, \$10,000 of which has already been raised.

The Peck, Stow & Wilcox Company's main factories, at Southington, Conn., are again in full operation.

Lees Mfg. Company, Westport, Conn., are making over 100 different kinds of twine and make special twine for any purpose and put up in any way. They are running full time, and have only stopped for two weeks during the present year.

Clayton Bros., manufacturers of steel laid and cast iron shears, hardware specialties, &c., Bristol Conn., and 122 Chambers street, New York, have enlarged their plant so that their facilities for filling orders are much improved.

W. H. Davenport Fire Arms Company, Norwich, Conn., are preparing new designs and models for next year's business, and are intending to issue a complete catalogue which will represent their present as well as their new models.

The Frazier Cycle Company, 373 and 375 Wabash avenue, Chicago, with factory at Aurora, Ill., have so far built no bicycles, their attention having been confined exclusively to the manufacture of pneumatic sulky wheels, ball bearings for high wheels, &c.

The Kilmer Mfg. Company, Newburg, N. Y., are extremely busy and behind their orders.

The loss in the fire at the works of the Clinton Wire Cloth Company, Clinton, Mass., on April 19 last, has been adjusted, the loss being fixed at \$170,000. This covers the loss to buildings, machinery and stock in process of manufacture. Through the system of insurance followed, the company's loss not covered by insurance is very small. Work on the new mill is progressing rapidly. The mill will be ready for the placing of machinery about December 1.

The factory of F. E. Myers & Bro., Ashland, Ohio, is now running full force. The firm have made a number of valuable improvements and are better equipped than ever before. They have recently placed a new 15-ton Colliau cupola in their foundry, and refitted the cleaning room with the latest equipments in that line, which will increase the capacity of the foundry nearly one-half.

J. E. Rhoads & Sons, manufacturers of oak tanned leather belting, Wilmington, Del., and 229 Market street, Philadelphia, make specialties of heavy driving belts and Volto dynamo belting, which they refer to as a superior brand and which is treated with their preparation for increasing adhesive power and pliability. They have recently put in several new machines and have a very well equipped shop. They have several power presses, the widest of which will make a 72 inch belt. They also have improved machines for working, stretching and finishing their leather. The firm are also dealers in lace leather, rubber belting, hose, packing, &c.

The Gormully & Jeffery Mfg. Co., Chicago, are preparing to build a new eight story factory, 120 feet long, which will afford additional floor space of 1½ acres. For this purpose they are tearing down the old warehouse, corner of North Franklin street and Institute Place, Chicago.

Bissell Carpet Sweeper Company, Grand Rapids, Mich., have recently completed a six-story addition to their factory. Something like 54,000 square feet will thus be added to their floor space, with a corresponding increase in their manufacturing capacity. Their plant now contains about 160,000 square feet of floor space. The factories throughout are designed for the special convenience of the carpet sweeper business, and much of the machinery differs materially from that in use in any

other line of manufacture. Every precaution has been taken against fire and the buildings are regarded as thoroughly fire proof. The very large sale which the Bissell sweepers have had is evidenced by the fact that during the past seven years the factory floor space has been quintupled. The capacity of the works now exceeds 1200 sweepers per day. Branch stores of the company are located in New York, Boston, London, Rotterdam, Hamburg, Melbourne and Sydney.

The American Ormonde Company, New York, will hereafter conduct their wholesale and retail departments entirely independent of each other. The wholesaling will be done at a new depot, soon to be opened in the down town portion of the city, while their retail department will be carried on in their new store, 135 West 125th street. It is understood that the Ormonde wheel will in future be manufactured in this country, and not imported, as formerly.

The Homer D. Bronson Company, Beacon Falls, Conn., make a specialty of fine art metal work of electro bronze from architects' drawings, models, carvings, &c., for interior decoration of all descriptions, including panels for dados, friezes, doors, mantels, sideboards, houses, steamboats, palace cars, furniture, pianos and organs, billiard tables, &c. The company have just completed a quantity of ornamental bronze work finished in gold for the Columbus Building, Wabash avenue, Chicago, from architect's designs. In addition to the above work the company manufacture wrought brass butt hinges, finely polished and plated piano and organ hinges, continuous and sectional hinges for every purpose, any width and length, fancy and irregular shapes to order, wrought brass pressure bars and brass goods in general.

Yale & Towne Mfg. Company, New York, have received the contract for refitting the New York Post Office with an entire new outfit of lock boxes. They recently fitted the new branch post office in the Industrial Building, at Forty-third street and Lexington avenue, New York, with all of its post office furniture, including routing, letter distributing, pouching and mailing cases, tables and all the paraphernalia of a complete post office.

The League Cycle Company, Hartford, Conn., advise us that their orders for their chainless safety have forced them to work overtime and that the capacity of their plant has been tripled, a fact which they refer to as indicating the merits of their wheel and its excellent workmanship, finish and design. The company are contemplating making large additions to their plant in the way of new and improved machinery and expect to have an excellent season in 1894.

Franklin Brass & Bronze Company have about finished a new factory at Derby, Conn., which they expect to occupy and operate the latter part of this month. They will manufacture the same class of goods formerly made by the Franklin Brass Company, at their factory in Buchanan, Va., destroyed by fire two years ago, soon after starting up. They now have at Derby a well equipped plant for producing refrigerator and box trimmings, hinges for water closet seats, hasps, door numbers, molding hooks, cabinet and builders' hardware, escutcheons, shutter bars, flush lifts, brackets, cabinet hinges and butts. They expect to increase their line of builders' hardware largely. They have a foundry also for casting special goods to order, and will make this department a feature of their business. W. F. Brainerd will be in charge of the business at 111 Chambers street, New York.

Mossberg Mfg. Company, Attleboro, Mass., have recently united their Attleboro and North Attleboro plants and added to them by the purchase of additional machinery, so that they now occupy a new building with more than double their former floor area. With a better arrangement of departments and improved methods the company are now in a position to produce any work in their line more satisfactorily and economically than ever before. It is the company's intention in the future to always carry a complete line of jewelers' tools, while still paying particular attention to designing and constructing special complicated and automatic machinery of any kind.

Miscellaneous.

A force of over 200 men is now employed at the Terre Haute Car & Mfg. Company's works at Terre Haute, Ind., repairing

freight cars and finishing the construction of the two frame buildings located on the ground recently made vacant by the burning of the plant.

Benj. D. Stone of New York has been appointed receiver for the firm of Reubel & Taylor, manufacturers of brass goods, at Rome, N. Y. The liabilities are said to be \$17,000 while the nominal assets are much larger.

The Mount Vernon Car Mfg. Company of Mount Vernon, Ill., have certified to an increase of capital stock from \$150,000 to \$200,000.

The Chattanooga, Tenn., Car & Foundry Company are running in all departments and have a good number of orders ahead.

John V. Bacot of Jersey City and J. Friedenstein, president of the Anglo-American Iron & Metal Company, 213 Pearl street, New York, have been appointed joint receivers for the property in New Jersey, and Mr. Friedenstein has been confirmed as ancillary receiver for the property in New York. Assurances of support from the great majority of creditors have been received, and with the preparation of a statement of the condition of the company, which will be ready in a few days, it is believed that a continuance of the business under a receivership will be of short duration. The business will be continued on the same lines as heretofore, and the installment of a receiver will not in any way affect it.

Manager Kruesi says, regarding the rumor that the United States Wire & Cable Company had been absorbed by the Edison General Electric Company of Schenectady, N. Y., that the Wire & Cable Company have always been owned by the Edison Company, but had of late been conducted as a separate concern. Now a change has been made so that it will be conducted as a department of the Edison General Electric Works. Manager Kruesi also says that the force at the works is being increased.

The expanded metal works of Chess, Cook & Co., Rankin Station, Pa., are now running.

Eight new locomotives, constructed by the Rhode Island Locomotive Works of Providence, R. I., for the Manhattan Elevated Railway of New York, have been delivered.

The Charles Munson Belting Company of Chicago have received second advice from the Toledo Electric Company of Toledo, Ohio, that the 80-foot belt which they placed in the plant eight weeks ago is running just the same as the first day it was placed on the pulleys. This belt has been running steadily and overtaxed by work ever since that time, and the belt shows no signs of labor whatever.

The New Howe Sewing Machine Company, at Orange, Mass., have placed the contract with the Berlin Iron Bridge Company of East Berlin, Conn., for a new foundry and tumbling room. The building will be entirely of iron, 45 feet in width and 120 feet in length.

The strike of boiler makers in the shops of the Big Four system at Indianapolis, Ind., has led to violence and bloodshed, one man having been killed in an attack made by the strikers on the workmen who had taken their places.

A press dispatch from Philadelphia says that the Baldwin Locomotive Works of that city on Saturday again reduced their force in all departments. Unless there is a marked improvement in business there is a likelihood of a complete shut down. Last year at this time 5890 men were employed on double time. Now but 2480 are employed on half time. Then from 20 to 24 locomotives were turned out weekly. Now from three to five are made.

On the application of John A. Roebbling's Sons Company of Trenton, N. J., the court has appointed a receiver for the Kokomo Stamping Company, successors to the U. S. Projectile Company, Kokomo, Ind. The concern were reorganized August last, and the capital stock placed at \$50,000. The general business stagnation of the country is said to be responsible for the failure.

Officials of the Bath, Maine, Iron Works deny the report that there is any likelihood that the concern will be removed from Bath to New London, Conn. Nevertheless the New London Board of Trade has appointed a committee to look into the matter.

The statement of the Michigan Peninsular Car Company for the year ended August 31, 1893, shows net earnings of \$866,906, which, after paying fixed charges, includ-

ing a dividend of 8 per cent. on the preferred stock, leaves something more than 18 per cent. profit. Eight per cent. was paid on the common stock, and a little over 10 per cent. carried to the surplus fund. The cash assets of the company amount to over \$3,000,000, and the fixed assets to over \$7,000,000.

The Litchfield, Ill., Car & Machine Works may be removed to Memphis, Tenn.

The Western Iron Works have secured two contracts for work on the Mechanical Arts Building to be erected for the California Midwinter International Exposition at San Francisco. The Judson Iron Works will have the work on the Liberal Arts Building at a fixed price per pound.

Among recently authorized corporations in Illinois are the following: Globe Tin Plate Company, at Chicago; capital stock, \$45,000; for the manufacture of tin andterne; incorporators, James Spruce, William Killmer and Henry C. Gager. Schoolhouse Construction Company, at Peoria; capital stock, \$100,000; to build schoolhouses and for general contracting; incorporators, William D. Dickson, Henry Sandmeyer, Jr., and George F. Page. The Fuller-Danhoff Electric Company, at Chicago; capital stock, \$5,000,000; for the manufacture of electric light, heat and power; incorporators, Franz Fullner, A. B. Coon, Henry A. Gates and William B. Keep. Western Screw Company, at Chicago; capital stock, \$100,000; for the manufacture of hardware and machinery; incorporators, Michael J. Dunne, John T. Booz and Frank M. Burwash. Wabash Truss Hoop Company, at Mount Carmel; capital stock, \$10,000; for the manufacture of coopers' supplies and wagon materials; incorporators, Philip S. Reyman, Henry H. Mason and L. W. Miller.

At a meeting of the stockholders of the Allegheny Heating Company, suppliers of natural gas, with headquarters in Allegheny, Pa., the old Board of Directors was re-elected and the following officers were chosen: George Westinghouse, president; J. R. McGinley, vice-president; John Caldwell, treasurer, and W. D. Uptegraff, secretary.

A statement recently issued by the treasurer of the Philadelphia Natural Gas Company of Pittsburgh shows the condition of that concern on September 30, 1893, to have been as follows:

Debt.

Accounts payable.....	\$62,000.00
Security deposits.....	73,524.00
Bonds.....	139,000.00
	<hr/> \$274,524.00

Available Assets.

Cash.....	\$402,676.42
Accounts and bills receivable.....	310,086.15
Stock in other companies (paying dividends).....	385,970.00
	<hr/> \$1,098,732.57

The company during the quarter retired \$20,000 additional bonds. On June 30, 1893, the cash item amounted to \$515,000, and on September 3, 1892, it was \$228,000.

The entire plant of the Westinghouse Air Brake Company, at Wilmerding, Pa., is closed down for 30 days. During the shut down a new battery of boilers will be erected and other improvements made.

The Pitts Mfg. Company, the last agricultural implement concern in Will County, Ill., will be moved to Chicago this week and located at Columbia Heights. The castings, stock and machinery of the big plant were placed on freight cars last week ready to begin shipment on Monday. When in operation the new plant will give employment to between 500 and 800 skilled mechanics.

Mayor Latrobe and Charles T. Crane of Baltimore, Md., have been appointed receivers of the South Baltimore Car Building Company, one of the largest concerns of its kind in the country. The financial stringency is given as the cause of the embarrassment. The assets are about \$617,000, and the liabilities \$294,000. The company have been in operation several years, employs hundreds of men, and have a large plant at Curtis Bay, a few miles from Baltimore.

The Gilbert Car Works, on Green Island, near Troy, N. Y., have resumed operations after a shut down for six weeks under a receivership. Employment was given to nearly 300 men. The works are sure to run until 50 cars for the Lake Street Elevated Road in Chicago have been completed.

TRADE REPORT

The best that may be said is that the past week has not brought any more particularly unfavorable developments in the Iron trade proper. Like every other industry and business throughout the country, it is suffering from the failure of the Senate to put our currency question into proper shape. With admirable patience the business community has suffered without displaying more than pardonable exasperation. We do not believe that this phase will last much longer. It will take but a small impulse to bring about the ears of the Senators a cyclone of wrath from the business world which will put an end to dallying. It will be made apparent who are the masters and who are the servants.

Every day's delay pushes further into the future the prospects of a recovery. Every day's delay drags nearer to the brink of bankruptcy many merchants and manufacturers. It is steadily sapping the vitality of the strongest. Business men not only owe it to themselves but to their employees to adopt vigorous measures. When the threatened bread riots come this winter, with their loss of life and of property, they will not be quite free from their share of blame, since they have not yet exhausted their power of coercion.

From the majority of the Iron trade centers comes the same talk of discouragement. In isolated cases there are reports that a moderate volume of business is coming up, but orders which would hardly cause comment in ordinary times are eagerly pointed to now as offering some encouragement.

How light the purchases of the railroads are, who are the greatest customers of the iron industry, is proven by the report that during the whole month of December the deliveries of Steel Rails by the mills amounted to 32,000 tons, or about one-fifth of what they ought to be in ordinary times. While it is true that special circumstances may have led to singling out this branch as the dullest in the whole industry, we believe that statistics relating to the car shops and the locomotive builders would display very striking figures too. The Iron trade needs the immediate repeal of the purchasing clause of the Sherman act, and wants peace for a long time after that.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., October 17, 1893.

The situation as regards the market for Iron and Steel shows only slight changes from last week, and these not altogether of a favorable character. The only good feature is a better demand for rolling mill products, although without any corresponding increase in prices. The shipyards are taking material somewhat freely, and with further inquiries from this source, and for architectural purposes, manufacturers are beginning to feel that there is a reasonably good prospect of being able to keep their machinery in operation. In other departments there is no improvement whatever, and the outlook for the winter months is anything but cheering. Nevertheless, prices are down to a point beyond which it is almost impossible to show further recession, and with an output of Pig Iron only about 40 % of what it was during the first six months of the year, it is surely time to look for something of a reaction. The spirit of speculation has been so thoroughly crushed, however, that on the principle that "sufficient for the day is the evil thereof," there is very little disposition to operate, except to cover contracts actually in hand.

Pig Iron.—The feeling as regards Pig metal is exceedingly dull. Prices are weaker and lower, yet with a production of only 40 % of what it was a few months ago, there is more unwillingness to buy than when prices were very much higher and production twice as large as it is to-day. This can only be explained by the fact that consumers have very few orders on their books, and that recent experience has shown that no matter how cheap they might secure Iron one day, they could do still better in their next purchase. This, of course, cannot continue indefinitely, and there is little doubt that prices are either at rock bottom or within sight of it, but all the same there is no disposition to buy anything that is not actually needed, no matter what inducement may be offered as regards prices. The usual quotations are about \$12 @ \$12.50, delivered, for standard brands of Gray Forge; \$13 @ \$13.50 for No. 2 Foundry, and \$14 @ \$14.50 for No. 1. Southern Irons can be had at less money, several lots having changed hands at \$11.50 @ \$11.75, with a fair chance that orders could be readily placed at the same or slightly lower figures for good sized lots and prompt settlements.

Steel Billets.—Prices are still on the down grade, with sellers at \$19.75 @ \$20, but very little demand. For 1000s ton lots it is thought that \$19.50 or less would be accepted, but as consumers' requirements are only moderate bids are not forthcoming, except for very small lots. Sales were made in lots of 100 to 200 tons each at \$20 @ \$20.25, but more recently the feeling has become weaker, and \$20 would be regarded as a full quotation for any kind of an order, and from that down to \$19.50 or less for a good sized lot.

Finished Material.—The market is looking better as regards the volume of business, but not as regards prices. There are several inquiries from the shipyards, which, with the work taken during the early spring, is helping the mills considerably. There is also something doing in buildings; one at Tenth and Filbert, in this city, will call for 1500 tons, the Boys' High School will take sev-

eral hundred tons more, so that there is a little business around, although compared with the capacity it is a mere drop in the bucket. The general demand for small lots is also pretty fair, but taking the most hopeful view of the situation, the prospect for winter work is less favorable than for years past, and if mills make half time it is about as much as can be hoped for, unless some very unexpected change occurs. Prices are weak, and on any good sized order it is easy to secure liberal concessions from quotations on small lots, which are about as follows:

Grooved Skelp, delivered.	1.50¢	@	1.55¢
Best Refined Bars.....	1.55¢	@	1.60¢
At interior points.....	1.50¢	@	1.55¢
Tank Steel.....	1.60¢	@	1.65¢
Heavy Plates.....	1.65¢	@	1.70¢
Shell.....	1.75¢	@	1.85¢
Flange.....	2.00¢	@	2.20¢

Old Material.—The market is extremely dull, and prices liable to weaken under any extra pressure to sell. Asking prices are about as follows:

No. 1 Wrought Scrap, delivered.....	\$12.00	@	\$13.00
Machinery Cast, delivered	10.00	@	11.00
Heavy Steel Scrap, delivered.....	13.00	@	14.00
Old Iron Rails, delivered.	15.00	@	16.00
Old Street Rails, delivered.....	17.00	@	18.00
Wrought Turnings, delivered.....	10.00	@	11.00
Cast Borings, delivered...	6.00	@	7.00
No. 2 Light Scrap.....	6.00	@	7.00

Dreifus, Block & Co. of Pittsburgh, dealers in Iron and Steel Scrap, Billets and Muck Bars, have recently opened an office at 421 Chestnut street, Philadelphia, under the management of E. Dreifus.

Janney & Steimetz are among the latest candidates for business in Coal, Coke, Iron, Steel and Aluminum. The last mentioned article is to be made one of their leading specialties, both in the ingot and in its manufactured shape. Their office is in the Philadelphia Bank Building, 423 Chestnut street.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, October 18, 1898.

No improvement can be discerned in the condition of trade. Everything is waiting. A great deal of business is reported in prospect which might be transacted at an early date if Congress would act decisively on the currency question, but every day lost makes the prospects fainter for anything of consequence this year. Many are of the opinion that not much can now be expected before next spring.

Pig Iron.—But few sales during the past week are of sufficient importance to mention. Among these were 500 tons Southern Coke Foundry, 500 tons Lake Superior Charcoal, 300 tons local Coke and a few 100-ton lots. Carload orders have been fair but not very numerous. Some Iron houses reported the past week as one of almost complete stagnation with them. In view of the very low prices reported elsewhere it may be interesting to state that Southern Mottled Iron has been sold here within the past few days at \$10.85, equivalent to \$7 at furnace. The attitude of the Southern companies represented here is one of continued firmness and our quotations represent actual prices obtained. Buyers are reported to be generally satisfied with present prices and the only question with them

is that of getting orders for their own products, when they would be glad to place contracts for the Pig Iron required. Shipments of Coke Iron from the furnaces are steadily increasing, largely on account of the growing consumption of agricultural concerns. Some little improvement, however, is noticed in the consumption by general foundries. The sale of Charcoal Iron reported was on account of a bankrupt company, but it brought a price fully equal to our quotations, which shows remarkable strength in that class of Iron. Quotations are now as follows for cash:

Lake Superior Charcoal.....	\$16.00	@	\$16.50
Local Coke Foundry, No. 1...	13.50	@	14.00
Local Coke Foundry, No. 2...	12.75	@	13.00
Local Coke Foundry, No. 3...	12.50	@	12.75
Local Scotch.....	14.00	@	14.50
Ohio Strong Softeners No. 1...	15.50	@	16.00
Southern Silvery, No. 1.....	12.50	@	14.50
Southern Silvery, No. 2.....	12.35	@	14.00
Southern Coke, No. 2.....	12.35	@	12.60
Southern Coke, No. 3.....	11.60	@	11.85
Southern, No. 1, Soft.....	12.35	@	12.60
Southern, No. 2, Soft.....	11.85	@	12.10
Southern Gray Forge.....	11.10	@	11.35
Tennessee Charcoal, No. 1...	16.00	@	16.50
Alabama Car Wheel.....	18.50	@	18.75
Hocking Valley, No. 1.....	15.25	@	16.00
Jackson County Silvery.....	16.00	@	17.00

Bars.—Considerably more inquiry is reported and some sales have resulted. The quantity purchased, however, falls very much under the usual amounts bought by the same parties under ordinary circumstances. Carload lots are now about the general run of business and larger sales are rare except on season contracts. One good agricultural contract was placed last week. Specifications are coming in a little more freely on season contracts also. The tendency noted some time since to substitute Steel for Iron is not so marked. The price of Common Iron is now so much below that of Steel that Iron is maintaining a good position in the market. Prices for ordinary lots of Bar Iron, mill shipment, range from 1.42½¢ to 1.45¢, half extras, Chicago. Soft Steel Bars of good quality sell at 1.57½¢ @ 1.60¢. Jobbers have experienced a little better business during the past week, but much of this is attributed to orders received from large consumers who are buying from store in small quantities rather than from mill. Prices on small lots from stock are weak at .65¢ @ 1.70¢ for Bar Iron and 1.70¢ @ 1.75¢ for Soft Steel Bars.

Structural Material.—No large contracts are reported. Business in small lots is fair. Steel is now entering quite considerably into the construction of much smaller buildings than hitherto. Architects are even considering the desirability of specifying Steel Beams for certain uses in dwellings. This is expected to be an important development of the present era of low prices. Quotations are maintained at the following prices on mill shipments, Chicago delivery: Beams, 1.75¢ @ 1.90¢; Tees, 1.95¢ @ 2.05¢; Angles and Universal Plates, 1.75¢ @ 1.80¢.

Plates.—If there was any business of consequence prices from mill would be considerably reduced. Current business is confined to such small lots, however, that our quotations fairly represent the market. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.75¢ @ 1.80¢; Shell Steel, 2¢ @ 2.10¢; Flange Steel, 2.15¢ @ 2.30¢; Fire Box, 2.75¢ @ 5¢. Store prices now prevail as follows: Iron or Steel Sheets, Nos. 10 to 14, 2.25¢ @ 2.40¢; Tank Steel, 2.10¢ @ 2.20¢; Shell Steel, 2.20¢ @ 2.40¢; Flange Steel, 2.50¢ @ 2.65¢; Boiler Tubes, 70¢.

Sheets.—The demand for Black Sheets is excellent from mills in a position to make prompt deliveries. Jobbers are not holding prices firmly from stock, and in some cases are reported to have named figures very close to quotations now current from mill. They are doing better on Smooth Iron and Sheet Steel. Quotations on mill shipments, Chicago delivery, for No. 27 Common Black Sheets range from 2.75¢ to 2.80¢, while small lots from stock sell at 2.90¢ @ 3¢. Galvanized Iron has been in remarkably good demand and for the first time in many months some of the mills have refused to take further orders, as their capacity is covered for the immediate future. Juniata Galvanized continues to be quoted at 75 % off for mill shipment with freight added. Sheet Copper is in light demand, but is still quoted at 30 % @ 35 % off, according to quantity.

Merchant Steel.—More specifications are coming in on season contracts than in previous weeks, but still not in sufficient quantities to satisfy the manufacturers, who fear trouble in making prompt deliveries later in the year. Some new business has been entered during the past week from season buyers, and a fair trade has been done with the mills by jobbing houses. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery, Tire and Open Hearth Spring Steel at 1.90¢ @ 2¢; Ordinary Bessemer Machinery, 1.60¢ @ 1.65¢; Ordinary Bessemer Tire, 1.55¢ @ 1.60¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

Rails and Track Supplies.—The manufacturers of Track Material are deriving some encouragement from the increasing freight business reported by railroads running West and Northwest. They are doing a great deal more in transporting grain and provisions as well as merchandise, but the Coal and Iron shipments are still very light. A few orders for moderate quantities of standard sections were received during the past week, but the volume of business both in standard and light sections has been small. Standard sizes are unchanged at \$30 @ \$32; and Light Rails \$31.50 @ \$32. Iron and Steel Splice Bars 1.60¢ @ 1.65¢; Track Bolts with Hexagon Nuts, 2.50¢ @ 2.55¢; Spikes, 1.85¢ @ 1.90¢.

Old Rails and Car Wheels.—No transactions are reported in Old Iron Rails, but railroads are weakening and some have asked for offers from consumers of \$14.50. The latter, however, are now convinced that they will be able to buy cheaper, and are disinclined to offer even \$14. Old Steel Rails in long lengths are sold at \$10 @ \$10.25. Short pieces are worth \$7.50 @ \$8 on a parity with prices at Eastern points of consumption. Old Car Wheels are very quiet, and while single carloads are quoted at \$13.50 @ \$14, a large lot could not be sold except at a very material reduction from these prices.

Scrap.—The sale of a round lot of No. 1 Forge is noted. There are plenty of other inquiries, but buyers are trying to force prices lower than dealers are willing to accept. The demand for low grade Scrap is light. Steel is still neglected and Mixed Steel is now offered at a very low rate. Dealers' selling prices, net ton, are as follows: No. 1 Forge, \$10; No. 1 Mill, \$8; Sheet Iron, \$5; Pipes and Flues, \$7.50; Axles, \$15; Horseshoes, \$10; Fish Plates, \$12.75; Spikes and Bolts, \$10; Cast Borings, \$5; Wrought

Turnings, \$6.50; Axle Turnings, \$.8; Heavy Cast, \$9; Stove Plate, \$7.75; Malleable Cast, \$.8; Mixed Steel, \$.7, gross ton; Leaf Steel, \$14.50.

Metals.—Carload lots of Lake Copper are unchanged at 10¢ and casting brands maintain the old price of 9½¢, with very little doing. Considerable inquiry has been received for Spelter, but sales are light. It is now quoted at 3.50¢. Lead has been reduced to 3.25¢ @ 3.30¢, with plenty of sellers but very few buyers.

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, }
PITTSBURGH, October 17, 1893.

The same discouraging report of the condition of the Iron and Steel trades must be repeated this week. A very thorough canvass made among the trade here reveals the fact that as yet there is no indication of an early improvement, either as regards demand or prices. No one believes that things are going to remain as they are for all time, but it is the general impression that it will be very slow work to lift the Iron and Steel trade out of the rut into which it has gotten. Buyers seemingly have no confidence that bottom has been reached, and each time they enter the market they expect to buy to better advantage than before. Pittsburgh, with its unrivaled facilities for cheap production, continues to set the pace in naming low prices that practically leave makers in other sections entirely helpless. It would seem that a few leading makers have concluded that if they can earn interest on the investment until trade resumes something like its normal condition, it is better to run as full as they can, making the securing of orders the first consideration and prices the second. It is also evident that a determination exists in certain quarters to find out how low competitors can go before they will cry "enough." All this has largely brought about the present low range of values, until, as one maker aptly puts it, "it is no longer a question of quoting a price, but a question of how much you can get." In Plates the competition has been especially severe, and on fair sized orders prices have been made that are almost beyond belief. In Billets, too, the determination of one or two makers to take everything in sight has resulted in prices being hammered down until neither buyer nor seller can tell "where he is at." The large stocks of Pig Iron in hands of makers, coupled with the light demand and the eagerness to sell, have forced prices to a point where it is doubtful if the furnaces can come out whole. The situation, summed up, could hardly be worse, and the long hoped for change for the better cannot come too soon.

Pig Iron.—The market continues a waiting one, and although buyers are aware of the fact that furnaces are offering their product at about cost, or perhaps below, orders continue to come in for immediate requirements only. For a long time past buyers have had everything pretty much their own way, and they have not failed to make good their advantages. However, this may change sooner than expected, and when it does come it is not likely that producers of Pig Iron will be slow in making just as good use of their opportunities. Production in this district has been increased to the extent of

about 250 tons per day by the blowing in of the stack of the Monongahela Furnace Company, at McKeesport, on Mill Iron. Their other stack remains idle. For ordinary lots asking prices are as follows:

Neutral Gray Forge...	\$10.50 @	\$10.75, cash
All-Ore Mill.....	10.75 @	11.00 "
Bessemer Pig.....	11.25 @	11.50 "
No. 1 Foundry.....	12.50 @	13.00 "
No. 2 Foundry.....	11.50 @	12.00 "

We note a sale of 500 tons of Gray Forge Iron at a price equal to \$10.60, Pittsburgh.

Billets.—A very limited amount of Steel is changing hands, and prices continue to depend altogether upon size of order and terms of payment. For ordinary business makers continue to ask \$18 at maker's mill. There is a probability that for a good-sized order and favorable terms of payment some makers would shade this price. Other makers, however, seem to regard \$18 as the stopping place, and are inclined to refuse business at anything under that figure.

Steel Rails.—After a shut down of some months, the Edgar Thomson mill has again resumed, though not to full capacity. It is stated that enough orders are on hand to insure about 15 days' operation. It is now pretty generally admitted that \$29 does not represent the actual price on which orders are based, but that the price is shaded more or less, according to conditions. The Light Rail department of this plant is also in partial operation.

Ferromanganese.—We continue nominal quotation of \$55 at maker's mill for domestic.

Muck Iron.—With Billets at \$18, there is very little chance for Muck Bar, and there is practically nothing doing. We make nominal quotation of \$20.50 at buyer's mill.

Wire Rods.—There continues to be a very fair movement in Rods, and most of the mills have about all the business for October that they can handle. For November and December delivery \$26 at maker's mill is asked. A deal involving some 4000 or 5000 tons for delivery into next year is pending and may be closed before this week is out.

Structural Material.—Considering the fact that the active building season is about over, the demand keeps up fairly well. Of course no large orders are being placed, but the tonnage from the small buyers is fairly large. We quote as follows: Beams up to 15 inches, 1.50¢ @ 1.60¢, according to order. Angles and Universal Plates, 1.60¢ @ 1.65¢; Tees, 1.75¢.

Plates.—From a large maker we have reports of a slightly better demand, but none of the mills have enough business to give them full employment. It is in this department that prices have been cut to an unusual degree. For ordinary lots mills quote about as follows: Tank, 1.50¢; Shell, 1.65¢ @ 1.70¢; Flange, 1.80¢; Fire Box, 2.50¢ @ 4.50¢, according to quality. The quotation on Tank Steel continues to be shaded more or less for desirable business.

Merchant Steel.—Buyers are placing their orders a little more freely, although some of the largest buyers who have heretofore placed their orders for season requirements before this time have as yet done nothing in this direction. The small buyers are also placing orders a little more freely, and it is evident that stocks are very low. Prices are ruling about as follows: Open

Hearth Spring Steel, 1.85¢ @ 1.90¢; Bessemer Machinery, 1.65¢ @ 1.75; Toe Calk, 1.90¢ @ 2¢; Tool Steel from 5½¢ upward, according to quality.

Bars.—It is evident that mills in the Mahoning Valley have but little hope of starting up in the near future. Within the past week one concern there has discharged its entire office force, while another has notified its employees to seek work elsewhere, owing to the uncertainty as to when they will start up. In the Pittsburgh district mills are getting a fair share of work, but some of it is taken at prices that must represent a loss. We quote Steel Bars at 1.35¢ at mill, with Bar Iron extras. This price is occasionally shaded to some extent for good orders. Bars in the Valley are held at 1.35¢, half extras, and this price is also shaded slightly for desirable orders.

Wire Nails.—The demand for Wire Nails continues fairly active, and prices are a shade firmer. For close delivery mills are obtaining \$1.30 from jobbers, while to the smaller trade jobbers are charging \$1.40 @ \$1.45. Cut Nails are also in fair demand, and the market is represented by the quotation of \$1 @ \$1.05 at mills for the usual average. Through a typographical error, the quotation on Cut Nails in our issue of October 5 appeared as \$1.05 on a 30¢ average. It should have read on a 50¢ average.

Barb Wire.—There is a fair demand, but with most of the mills in operation there has developed an unusually severe competition to secure business, which has weakened prices to some extent. For ordinary business we quote Four-Point Galvanized at \$2.25 in carload lots, but for desirable orders this price has been slightly shaded recently. Painted is held at 40¢ less than above price in carload lots. Plain Wire we quote at \$1.50 for good sized orders.

Connellsville Coke.—For the week ending Saturday, October 7, there were in the Connellsville region 5464 ovens in blast, and 12,026 idle, with a total estimated production for that week of 37,186 tons. Furnace Coke is in light demand, and is held at \$1.10 in tons of 2000 pounds, f.o.b. cars in Connellsville region. Foundry Coke is quoted at \$1.50 to dealers and \$1.65 to consumers.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*, }
Bank of Commerce Building, }
St. Louis, October 18, 1893.

Pig Iron.—Continued dullness prevails in the Iron market. Sales run from carload to 100-ton lots, and seem to grow less daily. Prices are lower and there is nothing in the immediate future to build on for any advance. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$13.00 @	\$13.25
Southern Coke, No. 2 Foundry.....	11.50 @	11.75
Southern Coke, No. 3 Foundry.....	10.75 @	10.95
Southern Gray Forge.....	10.25 @	11.50
Southern Car Wheel.....	17.25 @	17.75
Lake Superior Car Wheel..	16.50 @	17.00
Ohio Softeners.....	16.00 @	16.50
Missouri Charcoal, No. 1 Foundry.....	12.75 @	13.25

Bar Iron.—There is very little demand either from store or mill, and while mills are running, they are not working full time. Prices are slightly

lower, as follows: Lots from mill command 1.47½¢ @ 1.50¢. Jobbers ask 1.62½¢ @ 1.67½¢ for lots from store.

Barb Wire.—Trade has fallen off somewhat since our last report. Jobbers quote Painted at \$2.05 @ \$2.10, while mill price in carloads to jobbers is \$1.95 @ \$2. Galvanized commands the usual advance. The immediate outlook is not encouraging.

Wire Nails.—The demand for Wire Nails is satisfactory, but prices cannot be called so. There are rumors of some low prices which, while not entirely substantiated, are doubtless true. Mills quote \$1.45 @ \$1.50 in carload lots to jobbers, which would doubtless be shaded in large quantities.

Rails and Track Supplies.—A fair amount of business is reported in this department. Prices unchanged. Steel Rails are nominally quoted at \$30 @ \$31. Old Iron Rails are dull at \$15, but no sales are reported at this figure.

Pig Lead.—There appears to be no bottom to this metal and 3.17½¢ is now freely quoted for this month's delivery. There is no speculative interest in the market, and so far as consumers are concerned, they are only buying as their absolute needs require.

Spelter.—The market continues in the unsettled condition noted in our last report. Offerings are made at 3.25¢ @ 3.30¢, without, however, inducing any buying. Until legitimate consumption makes its appearance any advance seems out of the question.

Cincinnati.

(By Telegraph.)

Office of The Iron Age, Fifth and Main Sts.,
CINCINNATI, October 18, 1898.

There has been very little change in the general features of the Pig Iron market during the week; the transactions have been restricted to supplying the current wants of the jobbing foundries and the stove works, but the purchases of the latter are not large, seldom running over 200 tons at any one time, and frequently much less; there has been no large demand for forward delivery, and while the stronger Iron companies in the South are not urging sales, and, in fact, have withdrawn from the market, because they have sold as far ahead as they care to, yet there are indications that almost any kind of Pig Iron could be bought for spot cash about as low as it has ever sold in a regular way, although it seems certain that there is no margin of profit in its manufacture. There are so many furnaces out of blast in the South and West that with even a small increase in the demand there would soon be a scarcity of Iron, but there appears to be no prospect for such an increase in the early future, especially if the Senate does not pass the Silver Purchase Repeal bill. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$12.75 @ \$13.00
Southern Coke No. 2.....	10.75 @ 11.00
Southern Coke No. 3.....	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1.....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2.....	14.50 @ 14.75
Lake Superior Coke No. 1.....	15.00 @ 15.25
Lake Superior Coke No. 2.....	14.00 @ 14.25
Hanging Rock Charcoal, No. 1.....	18.50 @ 19.00
Hanging Rock Charcoal, No. 2.....	17.50 @ 18.00
Tennessee Charcoal, No. 1.....	14.00 @ 14.25
Tennessee Charcoal, No. 2.....	13.00 @ 13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable.....	17.00 @ 17.25

Forge.

Gray Forge.....	9.75 @ 10.00
Mottled Coke.....	9.50 @ 9.75

The Mahoning Valley

YOUNGSTOWN, OHIO, October 17, 1898.

A market report when there is practically no market is something of an anomaly. No such period of dullness had ever occurred in the Mahoning Valley; business is absolutely lifeless and the controversy between the employers and the employees of the mills intensifies the situation. Not a mill in the valley is running and but two furnaces. Various attempts have been made to adjust the labor difficulties between the mill owners and the Amalgamated Association, but so far without avail. The mill owners object to signing an absolute scale running until July 1, 1894, giving as a reason that work is being done in other mills, notably at Pittsburgh, without any fixed period, and our mill owners feel that they might not be able to compete if tied up with a contract, which might be higher than others pay. There is but little business going for the mills at present, and the little work that is being done our mill owners and, of course, the workmen are losing, and the trade is gradually drifting elsewhere. A suggestion has been made that the scale be signed for a shorter term, or subject to a 60 or 90 days' notice, and this seems to meet with favor and may prove a solution of the troubles. Much ado is made by the local papers here for political effect, but this cuts no figure whatever in the minds of the proprietors. It is an expensive luxury keeping a plant idle, ranging all the way from \$300 to \$500 per month for each and every mill, and the problem is being considered from a purely business standpoint, and with no reference whatever to the political outlook.

Pig Iron.—No. 1 Foundry for softening purposes is in limited demand and the little sold brings from \$13 to \$13.25 ¢ ton at the furnace; No. 2 grade, \$12 @ \$12.25. No. 1 strong Foundry is quoted at \$12.50 ¢ ton at the furnace, and No. 2 \$11.50. Mill Iron ranges at \$11 and a shade less, delivered at the mills. A recent sale netted the furnace \$10.85 and an offer of \$10.75 at the furnace was refused. Southern Iron has been practically knocked out from this market. An occasional stray lot of Southern Mottled Iron is offered here, but not enough to cut any figure.

Finished Products.—Bar Iron ranges from 1.35¢ to 1.40¢ rates, and Sheet Iron 2.60¢ for No. 27 gauge. The stocks at the mills are badly broken up and it is difficult to fill orders.

Financial.

Considered as a whole there has been little or no change in the financial situation during the past week. Uncertainty remains the dominant feature. Senatorial action on the Silver Purchase Repeal bill is not appreciably nearer, and rumors of compromise still prevail, while the feeling of assurance in the ultimate triumph of unconditional repeal waxes weaker from day to day. It is true that the repeal bill is not defeated yet. There is still a chance that it may pass, but the reports from Washington are not encouraging, nor are they calculated to infuse confidence into the business community. The failure of the continuous session last week to force action on the bill had a decidedly depressing and unsettling

effect in Wall street, as well as in the London market, causing a tumble in prices of stocks and bonds, with steady selling of securities on both home and foreign accounts.

The influence of the same abortive effort on the New York banks was also marked. These institutions had been, until Friday, offering freely large sums of time money on collaterals at easy rates. On that day, however, the offerings were withdrawn, as, notwithstanding the fact that the banks are amply furnished with surplus funds, they do not care to let any portion of their reserves go beyond their easy control while the fate of the repeal bill remains uncertain.

That a robust element of hope still exists in Wall street is proved by the remarkable way in which the values of securities have, on the whole, been maintained, in the face of delay and discouraging reports from Washington, continued unfavorable returns of railroad earnings and rumors of difficulties in various quarters. Although the majority of stocks on the list display a decline from the quotations of a week ago, yet the decline has been comparatively small, and nearly all securities still rule materially higher than they did a couple of months ago, showing an underlying strength that was lacking during the recent panic.

Money continues to flow into the coffers of the New York banks from the interior at the rate of nearly \$1,500,000 a day. Saturday's statement of the Associated Banks showed an increase in surplus reserve of \$5,267,325, bringing the amount held in excess of legal requirements up to very nearly \$34,000,000. The increase in deposits during the week was \$12,260,300, and the net gain in cash \$8,332,400, of which \$6,006,700 was specie. Loans were increased \$2,374,200. To counterbalance the large inflow of money, the demand for currency from the South to move the cotton crop is beginning to be felt by the New York banks, and some heavy remittances have been made in that direction during the present week. The banks are, at the present time, rapidly canceling their Clearing House loan certificates, the amount of which outstanding in New York has been reduced to a little over \$5,000,000. Outstanding Boston loan certificates are practically wiped out.

The publication of the official statement of condition of the national banks on October 3, made to the Comptroller of Currency, exhibits in a very gratifying manner the strength of those institutions, and generally shows material improvement to have been made over the conditions reported on July 12, the date of the last returns. The figures of the national banks of this city reveal remarkable strength, considering the storm and stress to which those institutions were exposed in the summer.

Deposits, which had fallen from \$242,800,000 on May 4 to \$218,800,000 on July 12, had risen to \$227,300,000 on October 3. Loans, which were \$310,700,000 on May 4 and \$309,100,000 on July 12, were \$283,600,000 on October 3. Specie, which was \$63,900,000 on May 4 and \$55,300,000 July 12, was \$75,600,000 October 3. The continued depletion of the Treasury gold reserve, which has run down to \$84,500,000, is causing serious consideration, on the part of the Treasury officials, of measures to build the reserve up again, and it is thought that the amount will not sink much lower.

The aggregate loss of railroad earnings on 131 roads during September was 9.77

%, as compared with 13% in August, a reduction which does not fulfill the sanguine expectations formed previously. The roads show, too, a loss for the nine months of the year, which is almost without precedent, and which reflects most substantially the general business depression, notwithstanding an increase in passenger traffic shown by the trunk lines carrying World's Fair visitors. *Bradstreet's* reported another increase in the number of failures during last week, which are placed at 406 in the United States, against 365 in the preceding week and 191 in the corresponding week of 1892. Twenty-nine of these failures were with capital in excess of \$20,000 each.

On the Stock Exchange the volume of transactions has been narrow and the trading mainly of a "professional" character. Corage stocks were in demand and strong on Thursday, owing to the announcement that the Reorganization Committee had reached an agreement with the security corporation, whereby the latter had assented to take \$6,000,000 first preferred stock for an equal amount of bonds. The position of the stock was further strengthened by a rumor that the committee had at length overcome all difficulties in the way of a rehabilitation of the property, and that they would presently publish the looked for statement of the status of the company. Friday saw a sharp decline in stocks and bonds on the news of the continuous session *fiasco* at Washington. Grangers and Industrials fell from 2 to 3 points, and the majority of other securities followed suit; but the week closed with a slight recovery all round. On Monday stocks were stronger, with very light dealings. Rumors current in regard to Atchison caused a sharp drop in that stock. Tuesday's market was feverish and irregular, clearly reflecting the existing condition of financial uncertainty. "Bear" attacks caused a drop in grangers, but Reading stocks, which had been depressed in the expectation of foreclosure on the Spezer loan, rallied on rumors of a satisfactory arrangement in the matter having been arrived at. The announcement of the Union Pacific receivership on Friday had absolutely no effect on stock in the market, the event having been previously discounted. The following list exhibits the extreme fluctuations of the more active stocks during the week under review, with the closing prices on October 19:

	High- est.	Low- est.	Closing, Oct. 11.
Am. Sugar Ref.....	91½	88½	91½
Atchison, T. & S. P.....	19½	16½	18½
Balt. & Ohio.....	69	65½	65½
Chicago Gas.....	60½	57½	59½
Chic., B. & Q.....	80½	77½	78½
Chic., Mil. & St. Paul.....	59½	56½	58½
Chic., Rock Isl. & Pac.....	64½	59½	61½
Del., Lack & Western.....	157	151	155½
Gen. Electric.....	44½	42½	44
Lake Shore.....	123½	119½	121
Louisville & Nashville.....	46	44	46
Manhattan.....	126	122½	125
Missouri Pacific.....	22½	20½	22
Minnesota Iron, asked.....			60
National Lead, Common.....	26½	25½	26½
New York Central.....	102½	100	100½
N. Y., L. E. & Western.....	14½	13½	14½
Northern Pacific, Pfd.....	22	18½	22
Philadelphia & Reading.....	18½	16	17½
Richmond & West Pt., Term.....	3	2½	2½
St. Paul & Omaha.....	35½	33	34
Union Pacific.....	17½	15½	17½
Western Union.....	82½	80½	82½

Call loans continue extremely easy. Rates have been quoted at from 1½% to 2½%, the last loan being at the lower figure. Business in the loan market is, however, of very limited proportions, owing to the absence of specu-

lation on the Stock Exchange, and the supply of loanable funds is largely in excess of the demand. The absence of demand for accommodation also rules in the market for time loans, where there is an abundant supply at 3½% @ 4% for 60 days and 4% @ 4½% for three to four months, on mixed collaterals readily marketable. Commercial paper continues quiet and the demand light. A few sales have been negotiated with out of town institutions on the basis of 6% @ 8%, according to the character of the indorsements.

Sterling exchange, which stiffened toward the close of last week on unfavorable news from Washington, has lost again this week, rates being reduced on Tuesday. The market is narrow and steady, and the supply of cotton bills fair, with small inquiry from remitters. Actual rates for sterling are quoted as follows: 60 days', \$4.82½ @ \$4.83; demand, \$4.84½ @ \$4.85; cables, \$4.84½ @ \$4.85½; commercial, \$4.81½ @ \$4.81½. Domestic exchange on New York is quoted as follows: New Orleans, commercial 150 discount, bank par; Charleston, buying ½ @ ⅞ discount selling par; San Francisco, sight 17½; telegraph 27½ premium; Savannah, buying ½ discount, selling ½ discount @ par; St. Louis, 90 premium; Boston, 20 @ 15 discount; Chicago, 80 to 85 premium.

Government bonds are weaker. A sale of \$3000 4s coupon at 111½ was noted on Tuesday. Closing quotations were as follows:

	Bid.	Asked.
2s, 1891, registered.....	98	...
4s, registered.....	110½	111½
4s, coupon.....	110½	111½
Cur. 6s, 1895.....	102	...

The railway and miscellaneous bond market has been weak and irregular, with narrow volume of business and declining prices.

Bar silver closed in London at 33½ pence ½ ounce, and in New York at 73½¢ ½ ounce. Treasury purchases on Tuesday were 142,000 ounces of silver at \$0.7340 ½ ounce. The total purchases thus far this month are 808,000 ounces. Exports of silver during the week have been heavy. Apparently India's demand for the metal has not been appreciably reduced by the recent suspension of free coinage in that country. Since January 1 London has sent more silver to India and to China than in the first nine months of 1892.

The total amount of anthracite coal sent to market during the week ending October 7 was 1,004,666 tons, an increase of 13,095 tons as compared with the corresponding week of last year. The total amount of anthracite mined thus far this year is 32,284,765 tons, an increase of 724,407 tons, as compared with the corresponding period of last year.

Metal Market.

Copper.—Exports continue liberal, and deliveries on home trade orders are fairly large. Between the two a considerable portion of the product of various concerns has been taken up, and with general trade conditions in better shape than they are at present the market would probably show stronger tone. It happens, however, that there is more than enough Copper to go around, and prices are soft in consequence, although showing no radical change. In remote instances 10¢ is quoted for Lake Superior Ingot, but there have this week been more sellers than buyers at 9½¢, and rumor had it that sales were made

at as low as 9½¢, net cash. Other varieties of the metal have suffered to a certain extent. Thus Electrolytic went at as low as 9½¢, although some brands were held at ½¢ more, while 9½¢ seems to have become top price for ordinary casting stock in round lots. It was rumored that some sales of the latter have been made at 9½¢ on net cash terms.

Pig Tin.—Comparatively little Tin has changed hands in a speculative way during the past week, but the market has gained somewhat in tone, although purchases by distributors and consumers have been on a rather moderate scale. The improvement, such as it is, may be attributed chiefly to the fact that the burdensome surplus of weak holders has been weeded down to narrow proportions, and that operators who control the bulk of stock have been disconcerted little, if at all, by adverse continued heavy movement of Tin from the primary sources of supply to Europe. Straits shipments during the first half of the month, it was advised, amounted to 1450 tons, including 1125 tons to Great Britain and 325 tons to the Continent, against 1275 tons during the corresponding period last year. Some few lots have been sent from Europe to this market, but not enough to have any decided influence upon the situation here. Bids were raised on Tuesday to 20.90¢, net cash, for prompt or current month delivery, but at the close of the week the buying spirit was exceedingly tame, and bids above 20.80¢ were strictly the exception.

Pig Lead.—There has been a further decline in prices and the market has had a depressed appearance. Consumers purchased indifferently, while other buyers virtually did nothing. At from 3.50¢ down to 3.30¢ probably 500 tons changed hands, with 150 @ 200 tons at the lowest figures. With Western markets quite as low, relatively, the position at the close was the reverse of encouraging. Bids of over 3.25¢ for carload lots delivered here were strictly the exception. At 3.35¢ the offering was fairly free at the close.

Spelter.—Prices for ordinary Western brands have fallen about 0.20¢, or to about 3.55¢ @ 3.60¢. This brings the cost of the metal down to an unusually low point, and, according to most calculations, leaves very little, if any, margin of profit to producers. Despite this, it does not appear that either consumers or dealers manifest any inclination to buy except as imperative wants necessitate, and exporters are not doing enough to relieve the situation. Hence a rather demoralized market and little chance of improvement in the immediate future, unless production be curtailed considerably.

Antimony.—For ordinary jobbing quantities there has been a fair demand, but the market is otherwise slow and prices are easy. We quote at 9½¢ @ 9½¢ for Hallett's, 10¢ @ 10½¢ for L. X., and 10½¢ @ 10½¢ for Cookson's, in round lots.

Tin Plates.—There has been a fitful demand in which ordinary Cokes shared the best, and sales to a very fair extent were made for prompt delivery and near future shipment. Prices for Cokes are quite firm, but bright Charcoals and Ternes barely hold their own. Spot quotations are as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$5.30; J. B. grade, do., \$5.45; Bessemer full weight, \$5.40; light weights, \$5 for 100 lb, \$4.85 @ \$4.90 for 95 lb, \$4.70 @

\$4.75 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60; Siemens Steel, IC basis, \$5.65; IX basis, \$6.75 @ \$7. Charcoals—Melyn grade, IC, \$6.35 @ \$6.87½; Crosses, \$8; Allaway grade, IC, \$5.60; Crosses, \$6.75; Grange grade, IC, \$5.75; Crosses, \$6.85. Charcoal Terns—Worcester, 14 x 20, scarce; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.35; do., 20 x 28, \$14.75; Dean grade, 14 x 20, \$5.30 @ \$5.37½; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$10.10; Alyn, 14 x 20, \$5.32½ @ \$5.35; do., 20 x 28, \$10.40; Wasters—S. T. P. grade, 14 x 20, \$4.75; do., 20 x 28, \$9; Abercarne grade, 14 x 20, \$4.60; do., 20 x 28, \$8.87½.

The monthly production of Copper in the United States since July, 1892, has been as follows, the first column giving the aggregate returns from the reporting mines, which include the principal Lake, Montana and Arizona producers; the second being the metal from pyrites and from a number of smaller outside sources, being estimated:

American Product.			
	Reporting mines.	Outside sources.	Total.
	Gross tons.	Gross tons.	Gross tons.
1892.			
July.....	9,294	924	10,218
August.....	10,807	870	11,677
September.....	9,710	994	10,704
October.....	9,868	1,239	10,957
November.....	9,838	1,036	10,824
December.....	9,872	1,174	11,046
Total six months	59,239	6,287	65,526
1893.			
January.....	9,187	989	10,176
February.....	8,213	1,042	9,245
March.....	9,065	1,321	10,386
April.....	11,775	1,042	12,817
May.....	12,706	1,042	13,748
June.....	11,524	1,042	12,566
Total six months	62,470	6,478	68,938
1893.			
July.....	11,049	1,042	12,091
August.....	11,745	1,042	12,787
September.....	11,750	1,042	12,792

The product of the foreign reporting mines and the United States exports were as follows:

	Foreign reporting mines.	United States exports.
	Gross tons.	Gross tons.
1892.		
July.....	6,358	3,450
August.....	6,863	1,545
September.....	5,478	1,453
October.....	6,476	3,144
November.....	6,789	3,897
December.....	7,666	4,486
Total six months	39,655	17,980
1893.		
January.....	5,736	3,171
February.....	6,762	1,815
March.....	6,896	2,334
April.....	6,813	3,450
May.....	6,806	4,482
June.....	7,935	5,209
Total six months	41,048	20,361
1893.		
July.....	6,095	7,181
August.....	7,057	9,127
September.....	6,303	16,131

New York.

Office of *The Iron Age*, 95-102 Reade street, New York, October 18, 1898.

Pig Iron.—The market continues featureless and exceedingly dull. We quote Northern brands \$14 @ \$15 for No. 1; \$13 @ \$14.25 for No. 2; \$12.25 @ \$12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, \$13.25 @ \$14.25 for No. 1; \$12.25 @ \$13.25 for No. 2; \$11.50 @ \$12.25 for No. 3; \$11.75 @ \$12.25 for No. 2 Soft, and \$12.25 @ \$12.50 for No. 1 Soft. Gray Forge is \$11.25 @ \$12.

Spiegeleisen and Ferromanganese.—In the imported material the market is excessively dull. The Rail mills are

supplied with material for a long time to come, at the present rate of consumption, while in Ferromanganese domestic takes the whole of the trade west of the Allegheny Mountains. We quote: Foreign Spiegeleisen, nominally, for 10 % @ 12 %, \$21.50 @ \$22, and 20 % \$25.50 @ \$26, on cars, Jersey City, and Ferromanganese, \$55.50 @ \$56.

Billets and Rods.—The domestic Billet market is weaker, and the same is true of Wire Rods. On foreign material there is no business, and little chance of any in the near future so long as the home product is so very low. We quote nominally: Domestic Billets, \$20.50 @ \$22.50, and foreign Billets, \$28 @ \$28.50, tidewater; domestic Wire Rods, \$29 @ \$29.50, and foreign Rods, \$39.50 @ \$40, tidewater.

Steel Rails.—Business continues very light. Some conception of the condition into which the Rail mills have been forced by the bad times is afforded by the fact that in the month of September the deliveries by all the mills in the association aggregated only 32,000 tons. The normal quantity should be five times that amount. Prices are entirely nominal. It is well known that the official price of \$39 was cut on a recent small order, and it is not denied that if there were any business worth fighting for buyers could get more liberal terms. The meeting of the association last week did not lead to the rupture which many predicted so confidently. No action of immediate influence upon the market was taken.

Track Material.—Small lots are selling at the following prices: Spikes, 1.80¢ @ 1.90¢; Fish Plates, 1.45¢ @ 1.60¢; Track Bolts, Square Nuts, 2.25¢ @ 2.40¢, and Hexagon Nuts, 2.40¢ @ 2.50¢, delivered. Concessions would be made for round lots.

Manufactured Iron and Steel.—No business of any consequence is coming up in this and tributary markets. We quote nominally: Beams up to 15 inch, 1.75¢ @ 2¢; 20-inch, 2¢ @ 2.25¢, for round lots; Angles, 1.75¢ @ 1.90¢; Universal Mill Plates, 1.65¢ @ 1.90¢; Tees, 2¢ @ 2.15¢; Channels, 1.80¢ @ 2¢, on dock. Steel Plates are 1.60¢ @ 1.70¢ for Tank; 1.75¢ @ 1.90¢ for Shell; 2¢ @ 2.15¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock; Refined Bars are 1.55¢ @ 1.9¢, on dock, and Common, 1.45¢ @ 1.55¢; Soft Steel Bars are 1.50¢ @ 1.70¢; Scrap Axles are quotable at 1.70¢ @ 2¢, delivered; Steel Axles, 1.70¢ @ 1.90¢, and Links and Pins, 1.70¢ @ 1.80¢; Steel Hoops, 1.75¢ @ 1.90¢, delivered; Cotton Ties, 70¢ @ 72½¢ @ 45 lb bundle, at mill.

Old Material.—We quote: Old Iron Rails, \$13 @ \$14; Old Steel Rails, \$8 @ \$9, and Wrought Scrap \$9 @ \$11.

Frank L. Fremont, 446 West street, New York, in announcing that he has made a voluntary assignment, on the 14th inst., conveys to the trade the information that he has retained his old connections with the Pencoyd Iron Works for the sale of their Beams and Structural Shapes, and has made arrangements with other mills to represent them in this market. He proposes, therefore to continue his regular mill business.

The Wellman Iron & Steel Company of Chester, Pa., have failed. A judgment for \$64,000 was entered by the Delaware County National Bank of Chester, execution was issued and the sheriff has taken possession. The suit

was brought on three notes, aggregating \$64,000, with Richard Peters, Jr., Samuel T. Wellman and John P. Crozer, all officers of the company, as indorsers. The concern were capitalized at \$1,000,000, and have over \$1,500,000 invested in their plant alone.

British Iron and Metal Markets.

[Special Cable Dispatch to *The Iron Age*.]

LONDON, WEDNESDAY, October 18, 1898.

In the market for Pig Tin there has been very little movement. Consumers have purchased sparingly and outside speculators have held aloof in view of the large stock here and heavy shipments from the East. Prices have not varied more than 5/. At the close Straights were quoted at £78. 2/6 for prompt and £78. 12/6 for three months' futures, with the market very quiet.

Copper has also been flat, and Merchant Bars declined to £41. 10/ for prompt delivery. Warrants continue weak owing to low figures at which fine metal is being sold. Speculative interest is almost nil pending decision regarding the Silver question in the United States. Dealers have, however, purchased cash lots quite freely at the low prices. Toward the close of the week more interest in futures was manifested, but the demand was quickly met, and the market gave way on reports of heavy American shipments, together with selling orders from that quarter. English smelters have reduced their prices owing to keen competition from American Ingots. Prices quoted at the close were £41. 10/ for Merchant Bars, prompt delivery, £41. 17/6 for three months' futures, and £45. 5/ for Best Selected English. Spot stocks decreased 459 tons during the first half of the month, and the visible supply is made to appear 61 tons less. Chili charters were 1200 tons.

In prices of Tin Plate there has been no radical change. Demand has slightly improved, but business at the quarterly meetings was not equal to anticipations owing probably to nearness of auction sales in London and Liverpool, which seem to have had a weakening effect. Work has been suspended at the Midland Works, Morriston. Liverpool quotations are as follows:

IC Charcoal, Alloway grade.....12/9 @ 13/8
IC Bessemer Steel, Coke finish.....11/6 @ 11/9
IC Siemens.....11/9 @ 12/0
IC Coke, B. V. grade, 14 x 20.....11/6 @ 11/9
Charcoal Terne, Dean grade.....11/3 @ 11/6

Pig Lead has met with slow sale and the market is weak with £9. 10/ about the best price for Soft Spanish.

Spelter continues in limited demand, and the market is flat, with sellers at £16. 15/ for ordinary Silesian.

In the market for Iron and Steel business has not improved and prices all along the line continue low and irregular. Last dealings in warrants were at 42/3 for Scotch, 34/3 @ 34/6 for Cleveland, and 44/6 for Hematite.

American Pig Iron for England.

A good deal of talk is being made over a trial shipment of 400 tons of pig iron from Anniston, Ala., to Derby, England. We believe that judgment in the significance of this should be suspended until one point has been cleared up. We sent dispatches of inquiry bearing on this point at the time of the earliest announcement of the shipment, but have not yet received a reply. The point in question is whether the iron is charcoal or coke iron. If it is the former, the matter has no significance whatever. For a good many years there have been occasional shipments of charcoal iron to England, which is used for special purposes, the quantity not exceeding a few hundred tons a year. If it so happened that this iron was sold by some furnace which had not done the business before, the transaction has formed the basis of a good deal of idiotic writing. We have had the opening of a new era burst upon us. We have begun to play once more, as we did during the last century, at making English ironmasters uncomfortable with our iron exports into their home markets, &c.

If, however, the shipment of Woodstock iron is the product of the coke furnaces at Anniston, then indeed it is curious, and indicates well the trying condition into which our iron trade has fallen. There may be some little glory in the pioneer transaction, but we fear that that is all there is in it. We trust, and in that feeling present and prospective shippers of American pig iron to England will probably join us heartily, that our own home market may soon return to its normal condition, when such high pressure outlets are not needed.

Bids for Gunboats Opened.

Bids for the construction of gunboats Nos. 7, 8 and 9, authorized at a cost of \$400,000 each by the current Naval Appropriation act, were opened at the Navy Department Tuesday. The bids were as follows:

Maryland Steel Company of Baltimore.—Gunboat No. 7, \$380,000; either gunboat No. 8 or No. 9, \$380,000; gunboat No. 7 and either gunboat No. 8 or No. 9, \$758,000; gunboats Nos. 8 and 9, \$750,000; all three gunboats, \$1,110,000.

John H. Dialogue & Son of Camden, N. J.—All three gunboats, \$1,186,000.

Union Iron Works of San Francisco.—Gunboat No. 7, \$400,000; either gunboat No. 8 or No. 9, \$385,000; gunboat No. 7, and either gunboat No. 8 or No. 9, \$785,000; gunboats Nos. 8 and 9, \$700,000; all three gunboats, \$1,100,000.

Coronado Foundry and Machine Company of Coronado, Cal.—Gunboat No. 7, \$372,000.

Bath Iron Works of Bath, Maine.—Gunboat No. 7, \$425,000; either gunboat No. 8 or No. 9, \$468,000.

Newport News Shipbuilding and Dry Dock Company of Newport News, Va.—Gunboat No. 7, \$290,000; either gunboat No. 8 or No. 9, \$306,000; gunboat No. 7 and either gunboat No. 8 or No. 9, \$585,000; gunboats Nos. 8 and 9, \$575,000; all three gunboats, \$840,000.

All of the foregoing bids are for the construction of the vessels in accordance with plans prepared at the Navy Department. Bids for construction under plans of the bidder were submitted as follows:

Union Iron Works.—Gunboat No. 8 or No. 9, \$377,000; for both, \$684,000; for all three, \$1,084,000.

Bath Iron Works.—Gunboat No. 7, \$368,000; either No. 8 or No. 9, \$382,000; gunboats Nos. 8 and 9, \$754,000.

The Newport News Company are the lowest bidders in each instance.

Sheet Mill Labor Troubles.

Probably before this article gets into print a settlement will be reached between sheet mill operators and their employees. The basis of this supposition is the knowledge of the writer that members of the Amalgamated Association have begun to realize that they have been very near downfall, and they are anxious to make such concessions as will enable them to retain the good will of manufacturers and help keep the association together. The men are now taking a common sense view of the matter, which has had its origin in a desire for self protection. The handwriting on the wall told them that they would receive harsh treatment from employers in the years to come if they failed to accommodate themselves to present circumstances, and an acceptance of the 10 per cent. reduction will be the probable result of negotiations now pending. Sheet mill men have always been faithful adherents and ardent supporters of the association. If serious differences are allowed to exist between them and manufacturers, and should the majority of sheet mills become non-union, the days of the Amalgamated Association would be numbered. From information of a semi-public character it appears that the more conservative members will cast their vote and use their influence to secure an acceptance of the manufacturers' terms. Circulars asking for a vote on the subject are now in the hands of the lodges, and an early announcement of the result is expected. So far as is known at this writing, the mills having given notice of 10 per cent. reduction are: New Philadelphia Iron & Steel Company, New Philadelphia, Ohio; Etna-Standard Iron & Steel Company, Bridgeport, Ohio, and Geo. W. Johnson, New Castle, Pa.

Trade Publications.

CRANES FOR MERCANTILE USES, as designed and built by the Industrial Works of Bay City, Mich., are illustrated and described in a catalogue just received. These include locomotive cranes of several different types and capacities, traveling and stationary jib cranes, electric overhead traveling cranes, hand power overhead travelers, pillar, transfer and jib cranes, &c. The cranes described make use of steam, electricity, power derived from shafting or that given by hand, as may be most convenient or desirable. The catalogue is handsomely illustrated with half-tone engravings and drawings of these cranes.

THE APPLETON MFG. COMPANY of Philadelphia send out a catalogue descriptive of their Challenge emery wheels and polishing machinery, to the manufacture of which a specially equipped establishment is exclusively devoted. They mention single and double, wet and dry grinding machines, universal grinding machines, cutter, surface and drill grinders and polishing and buffing machinery. Their twist drill grinder is so designed that it determines the correct angle and clearance for each individual size of drill, grinds all the lips exactly alike, and is so simple and easily operated that a boy can handle it.

JAMES SIMPSON & CO., LIMITED, of Grosvenor Road, Pimlico, London, England, have issued a catalogue, or rather book, in which they describe the Worthington

pumping engines built by them and give the results of some independent tests recently made of their engines, and also describe some of their own leading designs. Although they first heard of the Worthington high duty engine in 1886 they are now pumping 501,000,000 gallons daily with this pump. The trials referred to are of great value and are as follows: Report by Professor Unwin of trial at West Middlesex Water Works, Hampton. Report by Osbert Chadwick of trial at West Middlesex Water Works, Hammersmith. Report by T. F. Parkes of trial at Lambeth Water Works, Ditton. Report by Osbert Chadwick of trial at Grand Junction Water Works, Kew. Report by Mr. Goodman of competitive trial at Grand Junction Water Works, Kew. Report by Mr. Van Ysselstein on the New Sewage Engines at Rotterdam. Report by Mr. Van Ysselstein of trial at the Westeljk, Stoomgemeel, Rotterdam.

A VERY ELABORATE ILLUSTRATED CATALOGUE on wire rope has been published by the Broderick & Bascom Rope Company of St. Louis, Mo. It is stated that in order to meet the increasing demand for their ropes they have erected a new factory which has been thoroughly equipped with the latest and most improved machinery, principally of their own design. They are enabled to manufacture rope of any size and length, up to 100 tons weight, in one continuous piece, without splicing either the strands or rope, and with absolute uniformity of lay under equal tension on each wire and without twisting the individual wires. They supply steel ropes with a guaranteed breaking strain of from 60,000 to 300,000 pounds per square inch.

WE HAVE RECEIVED from the Edward P. Allis Company of Milwaukee, Wis., a large and handsomely gotten up book which, it is stated in the introduction, is not intended either as a catalogue of machinery or as an elaborate description of their plants. It is designed to give a fair idea of the establishment and the high character of its products. To assist in this direction the following statements are made: Actual floor space in buildings, 17 acres; average number of men employed, 1500; average monthly pay roll, \$75,000; approximate value of manufactured products per year, \$3,000,000; average output in castings per month, 3,300,000 pounds. It is also mentioned that the establishment built the largest stationary steam plant and also the largest pumping engine in the world; first introduced in the United States the triple and quadruple expansion stationary engines, and the first triple expansion pumping engines; built the largest flour mill in the world, and introduced the roller process of flour making in American mills. The book contains many half-tone engravings of their works and of the machinery made by them.

At a meeting of the freight agents of the railroads operating between Pittsburgh and the Mahoning Valley, held in Pittsburgh last week, a reduction was made from 6 to 5½ cents per 100 pounds, in carload loads, on iron from the Mahoning and Shenango valley points to Pittsburgh and points taking Pittsburgh rates.

D. T. Miller has succeeded John Hutzen as superintendent of the rail and blooming mills of the Edgar Thomson Steel Works, at Bessemer, Pa. Mr. Hutzen retires to take the position of boss over all the rollers—a new position recently created.

At last the gigantic forging press of the Bethlehem Iron Company, the largest and most powerful in the world, has been started. The press has been erected in the extension to the building of the famous 125-ton steam hammer. The press is rated at 14,000 tons, and is operated by 12,000 horse-power engines.

Chicago dispatches announce that J. O. Hughes of Hughes & Patterson, rolling mill proprietors, of Philadelphia, died in that city of apoplexy yesterday.

HARDWARE.

Condition of Trade.

BUSINESS on the whole shows little or no improvement during the past week. Some houses report a fairly active trade, but most jobbers and manufacturers do not give quite so favorable advices. There is certainly an important diminution in the volume of business this season as compared with last year. Seasonable goods are most active, but a good deal of complaint is made concerning the lateness of trade, which is, perhaps, explained in part by the fact that exceptionally fine weather has generally prevailed. It is not thought, however, that even in these lines the volume of business will be up to the average. Prices are, with a few exceptions, without change, but the undertone of the market is not strong, and it is expected that if present conditions continue there will be a tendency toward lower values.

Chicago.

(By Telegraph.)

The Shelf Hardware trade has fallen off again, very much to the discouragement of jobbers, who hoped and expected that the improvement noted last week would continue. It seems, however, to have been but a spurt with no lasting qualities. Some attribute the falling off to the very mild weather experienced during the greater part of the week, and have a slight hope that a recurrence of cold weather will again stimulate the demand. Others, however, are inclined to believe that the fall trade is now about over, and that from this time forward orders will only come in in small quantities as merchants run out of stock. The character of the trade is unchanged. Such orders as are being received are for broken lots, causing very much more than the usual trouble in packing. Western Hardware merchants continue to visit the fair in large numbers and are frequent visitors at the wholesale houses, but their visits are not attended with very much business. The Heavy Hardware trade was considerably better last week than during previous weeks. The improvement in business has been principally in the demand for Iron and Steel. It does not indicate a better condition of trade among the usual patrons of Heavy Hardware job-

bers, as a considerable part of this business comes from large consumers who ordinarily buy from mills.

St. Louis.

(By Telegraph.)

There continues to be a steady increase of small orders and in the way of winter goods fairly good trade is expected. Retailers continue to hold back orders and buy only as their absolute needs require. Wire Nails and Barb Wire are weaker and inclined to go lower. Stove goods, such as Coal Hods, Stove Boards, Stove Pipe, &c., are generally in good demand. While staple goods are only ordered in moderate quantities, collections are in good shape and continue to improve. Jobbers are pretty generally agreed that unless the Senate shortly repeals the purchasing clause of the Sherman bill the business for the balance of the year will be gone beyond recovery. Numerous telegrams and letters have been sent urging repeal, without, however, producing any effect. Until something is done in this direction any improvement is out of the question.

New Orleans.

A. BALDWIN & Co.—The situation of business in this section of the country shows a decided improvement for the past two weeks and seems to be getting around to its natural basis, as we can readily see by the orders we are receiving from sections of the country where we did not look for an improvement for some little time.

The improvement in the movement of the cotton crop and also the early arrivals from the sugar section have brought orders and customers, who are buying more liberally than we anticipated. The holding back principle, waiting for developments, has about passed away, and they begin to realize that it is the better policy to replenish their stocks and endeavor to get some share of the business moving. The volume is not very large, but it is such a vast improvement over the past 90 days that we are inclined to feel brighter anticipations as to the future.

The late storm in this section has caused considerable demand for almost everything in the building line, and some of the stocks are becoming quite broken. Altogether the situation is certainly much brighter and more hopeful for the future than we have had for a number of months past.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—The first two weeks of October have not shown the expected increase in trade over the last two weeks of September. They have held their own, however,

and the month at the present rate will show a fair increase over September. We are of the opinion that had action been taken some three weeks ago by those who have the country's finances in charge the very pronounced improvement would have continued and the result have been a good fall trade. It is now, however, too late for much recovery, and we will have to be content with only a fair amount of business. The Northwest has not as yet reached that point when a business equal to that of the year before is satisfactory. It must show a marked increase to be satisfying, and failure in this regard is a disappointment. Our disappointment is greater, therefore, when we contemplate an actual falling off.

We think we are correct in placing the blame for this condition on the shoulders of those who have been sent to Washington to look after our interests. The principle that the majority must rule seems to-day to have received a severe blow and we do not know how widespread an effect it will have on future legislation. We think the proper policy to be one of extreme conservatism until something definite is known. Our present activity is largely in the direction of laying in stock for winter consumption made necessary by the present low navigation rates of freight. Collections the past week have been almost good.

Portland, Ore.

CORBETT, FAILING & ROBERTSON.—The situation in this territory has grown rather worse than better since our last. In Eastern Oregon and Washington the harvest this year, owing to a backward spring, was from three to four weeks late. The early rains have caught more than half the wheat not cut, and a large portion of the cut not threshed. The farmers and warehousemen have been accustomed to stacking the sacked grain on platforms heretofore, as a little snow would not damage it. The rain has so soaked the sacks that they are now bursting, and liable to sprout the wheat. The damage to wheat, as now reported, will amount to a large sum, and, coming in addition to the low prices, will make collections very hard.

Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—Business has gradually assumed fairly large proportions, and now appears to have settled down to a steady thing. When business has about reached its normal condition, an improvement can hardly be expected every week, but it is enough to ask that it hold its own. The present volume is as large as could be reasonably expected under the conditions prevailing in the country, though taking it as a whole it is not on a par with what it was this time a year ago. Comparing the present season with two years ago, no occasion

will be found for fault finding with the present volume of business. It has been our opinion right along that the West would recuperate from the recent financial upheaval sooner than the East. Business in this part of the country is dependent more upon the farmers than upon the manufacturers, and fortunately the farmers have fair crops and are in a satisfactory financial condition. The products of the soil are sufficiently abundant and the market good enough to insure a fair amount of money in general circulation, and hence a reasonably good business in both a wholesale and retail way may be looked for.

Louisville.

W. B. BELKNAP & Co.—Business is increasing somewhat in volume; that is to say, orders are a little more numerous and decidedly larger individually. The country is so bare of goods that the natural wear and tear of consumption calls for a good deal of material to replace that which is worn out, even if there were not a single new project in sight.

Some articles on the list are strong and not in overabundant supply, such as Sheet Iron, which is firm at an advance of \$1 or \$2 over the lowest price reached during the summer.

Bar Iron, too, has a little backbone, but this is due largely to the fact that so many of the mills are shut down and stocks broken. With anything like production on the usual scale there would be a greatly overstocked market and consequent demoralization.

There is a better demand for Wire and Wire Nails, but prices so far on these articles have shown no recovery.

The continued cheapening of the raw material, Pig Iron, Steel Billets, &c., is likely to prevent any marked advances.

Ammunition and Loaded Shells are particularly scarce. Factories are evidently far behind their orders on these goods, and no matter if business is dull it is evident that the sportsmen will take to the woods as usual this season.

Game is rather abundant, and hunting is as near military service as many of the great army of unemployed want.

The dilatory tactics in the Senate are disgusting the people here. The reproach of Wall street—viz., excess of wealth—can scarcely fall on us, but we seem as helpless as the rest of the country to bring about anything better. One of our Senators, Lindsay, has done his best (and that is very good), but the obstructionist is a much harder man to deal with than the reformer.

Baltimore.

CARLIN & FULTON.—Trade, like the season, is in the "sere and yellow leaf," and though according to the calendar the autumn has but partly gone, yet from a business point of view the fall is almost over.

How the bright hopes of a country, based upon expected intelligent legislation, upon abundant harvests, upon a dearth of goods, upon a desire for trade, have been realized can be best answered by the ledger of every manufacturer and merchant throughout the land, by the idle mechanics in our streets, by the impoverished farmers, and the diminished incomes of widows and orphans.

The child at school should have another page added to his history, re-

coding the shameful fact that in the Senate of the United States are to-day men sworn to perform their duty to the Constitution and laws of this whole country, who, deaf to all appeals for patriotic action, to all petitions and remonstrances which have been sent from one end of the country to the other, deliberately defy public opinion and through a strained and ridiculous pretense of Senatorial courtesy, insult the sober common sense of the whole nation.

The idea that in the chief legislative body of this country no question at issue can be brought to the test of a vote, while there is a minority, no matter how small, to object, is simply preposterous. This is a matter involving the greatest interests of this Republic, and while to-day it is a question of silver, to-morrow it may be anything else; and if the supposed local interests and influence of one small section can dominate and dictate to every other section as it sees fit, the House of Representatives may as well spare itself the trouble of framing any tariff bill, unless they give the Republican party credit for more forbearance and forgetfulness than has ever been accorded them heretofore.

Without discussing the effects of a revision of the tariff by the present Congress, whether for good or bad, we do not believe from the present condition of affairs that the trade throughout the country need consider it at all, for if the silver bill cannot be repealed by a majority which exists in the Senate, a tariff bill cannot be passed with the majority uncertain.

It is almost useless to talk about prices; they have been well sustained for the reason that there has been no room for reduction and production has been limited by the factories either remaining idle or running upon half time.

Collections have improved somewhat, but we must remember that obligations, the result of purchases, have been remarkably small.

The responsibility for the future improvement of trade rests upon the Senate of the United States, and we wait upon it.

Boston.

BIGELOW & DOWSE.—This market is without change. Prices are being maintained and the volume of business doing is a slight improvement over the past month; but there is considerable falling off if compared with last year.

Everything is done on a very conservative basis. Stocks are being replenished only to complete assortments. Every one is waiting for Congress to do something that will establish confidence. Until such time as they choose to act the merchant must wait. While they are waiting they are thinking how little interest politicians take in the welfare of the country, and if the time is not fast approaching when the merchants will come to the front and insist upon their right to a larger representation in the national Congress.

At a meeting of the Boston Iron and Hardware Club, the past week, the name was changed to the "New England Iron and Hardware Club." The membership is rapidly increasing and every wholesale dealer throughout New England, every Hardware and Iron house in Portland, Maine, are now members. The meetings thus far have been very satisfactory and promise good results.

All the dealers in Manchester and Concord, N. H., have joined the case and carting agreement, to take effect November 1.

Cleveland.

THE W. BINGHAM COMPANY.—Trade since our last has shown a slight improvement, but is still behind that of last year at this time. All orders contain more or less seasonable goods and are evidently very carefully made up. The demand for Wire and Nails has fallen off and prices are correspondingly weak. City retailers report trade as slightly improved, as many factories that have been closed entirely are starting up on half or three-quarter time. Money is somewhat easier and collections are fair.

Philadelphia.

SUPPLER HARDWARE COMPANY.—

Investigation into the results of the jobbing Hardware houses in our city during the last two weeks shows trade has gradually moved from the low valley of depression to higher ground, where it remains, and although not likely to reach the summit of successful trade at one bound a gradual further ascent is anticipated.

There are many reasons why the sale of Hardware should be above the level of many other kinds of merchandise, although now persons in that line are slow to engage in new enterprises; but work already begun in building operations will likely be completed, consequently Hardware in that line will be required during the fall; besides, mechanics with employment must have the necessary tools and worn out Agricultural Implements will be replaced. These are quite as necessary as the paper upon which our daily or weekly press is printed.

Insufficient supply of funds in the vaults of our banks and trust companies no longer obstructs the channel of trade. Banks now far exceed their reserve limit and have a large surplus beyond.

There are several reasons for this being the case. First, country banks, instead of being large debtors, now show credit balances. Currency has been unlocked from private vaults and released from hiding places, and many of the manufacturing industries, especially in our own city, being either closed or working on partial time only, having gradually made collections of outstanding accounts, and not using them as heretofore for their weekly pay rolls, this money remains in bank on call until the prospect for trade brightens sufficiently to guarantee resumption of their factories. But the financial scare has largely abated.

The increase in deposits in the banks of New York, Boston and Philadelphia of nearly \$40,000,000 and the reduction of the combined clearing house certificates of those three cities of about \$40,000,000 within a limited period naturally makes a great difference in the financial condition, and this showing has astonished many of those who have asserted there was insufficient money for business purposes.

The present circulation shows over \$25 per capita, which is greater per capita than any country outside of France, and at the present time, for present requirements, with diminished trade in manufacturing, really more than actually required, for the present

reduction of trade is estimated to be not far from \$100,000,000 per month from enforced idleness.

There has been considerable complaint that, notwithstanding this large increase of surplus, the banks still refuse to loan their funds other than in the most conservative manner. There is, however, good and sufficient reason for this. They naturally desire to feel fully secure in their loans and discounts, and when they look upon the large number of industrial and mercantile failures throughout the country during the last three months, a conservative policy seems to them necessary; besides stocks, offered as collateral, as yet show no guarantee of stability.

Collections, as well as trade, have improved, although the former not to the extent desired, nor to the extent necessary for requirements of those who have been so leniently disposed toward those who still have accounts unpaid.

The improved monetary conditions of banking institutions throughout the country, regardless of the continued struggle in the Senate over the repeal of the silver purchasing clause, show conclusively that that law was not the sole cause of our financial embarrassment. Had it been, the financial conditions which existed in May and June would have grown more severe with each succeeding monthly purchase, and would have been aggravated by the continued agitation and increased uncertainty of its repeal (without some compromise being coupled with its passage.)

We intimated in an article in *The Iron Age* as early as August 3 that the reduction of the Government surplus was the chief and important factor of our financial troubles. Perhaps the greatest financial error President Cleveland ever made was during his former administration when he advocated the reduction of the Government surplus in order to save a small amount of interest. Although a mistake in theory, it became a popular cry, which both political parties adopted.

Popular opinion is usually correct after due consideration, but popular opinion is frequently impulsive in its demands before the facts and results are properly understood of what might be the natural results of reduction in case of decreased exports and increased importation, or a sudden call upon us from abroad for gold.

The seductive reason given for the surplus reduction was the saving of a few million dollars in interest, say three per cent. on \$150,000,000, or, net, \$4,500,000 per annum. While that effort in itself was commendable, but in the effort to save this sum (small in comparison with our expenditures) it was a mistaken policy, through which our country has lost hundreds of millions through failures and enforced idleness, and to-day we are compelled to look upon the humiliating spectacle of having encroached upon the \$100,000,000 reserve, which has been reduced to but a little over \$86,000,000, or ten per cent. on the dollar of our outstanding demand liabilities, with probably a continued decrease, owing to the monthly expenditures in excess of receipts.

It is simply impossible to continue in good credit at home or abroad with this absurd surplus, and provision must be made at an early date to have it restored. If this is not done we are liable at any time to undergo a repetition of our present financial troubles.

The Bank of England, which is looked upon world wide as an institution worthy of example, holds in reserve from

48 to 50 per cent. of outstanding indebtedness, and our own national banks of central reserve cities—*i. e.*, New York, Chicago and St. Louis—are compelled by an Act of Congress to hold 25 per cent of reserve, in addition to which they hold, as further security, discounted bills receivable usually to two-thirds of their deposits, which at ordinary times can, if necessary, be re-discounted through other banking institutions in case of immediate want.

Neither banking institutions, manufacturers nor jobbers, who conduct their business with intelligence, would ever risk their credit on such small and unsafe reserve as our Government adopted. It was this small reserve surplus in the vaults of the United States Treasury (it was then \$106,000,000 free gold) which caused foreign distrust of our ability to continue gold payments, and hence flooding our market with securities to be redeemed. It was not alone our paying out \$3,000,000 per month. This amount alone was small in comparison to the large drain that was being made upon us from the fact that balance of trade was against us.

President Cleveland doubtless realized the mistaken theory of our surplus reduction; indeed, tacitly admitted it in his special message calling Congress together, and deserves very great credit for the patriotic manner in which he presented the case before Congress. "A wise man is always open to conviction. Fools only never change their opinion." He is known to be eminently sound on financial questions, and especially sensitive regarding our financial national credit.

In 1879, when the Secretary of Treasury, John Sherman, resumed specie payments, the cash in the Treasury was \$382,450,695.96, and the Government receipts beyond expenditure were then sufficient to accumulate an additional surplus at the rate of \$20,000,000 each fiscal year, with our demand liabilities not far from one-half of the present outstanding demand liabilities.

At that time there were some pessimists who doubted the Government's ability to sustain specie payments, yet this same element now advocate a monthly increase of indebtedness when we hold but 10 per cent. in gold to pay present indebtedness.

It is therefore no wonder that foreign nations were uneasy early in the season when the balance of trade was so many millions against us and sold our securities. Indeed, there were some predictions that \$50,000,000 of silver certificates might be collected on foreign account and gold demanded for the same. What a sweep that would have been against our Government surplus; but owing to the fortunate circumstances of our having wheat, corn and cotton to export, coupled with the fact that foreign nations no longer required gold to further increase their reserve, the finances of our country have been able to recuperate.

The necessity of the repeal of the law compelling us to call upon our already depleted treasury for gold each month to buy silver we do not need daily grows more important, especially as our surplus is being daily reduced, and the Senate has not yet shown itself competent to master the situation.

It was intimated early in the present session by men of experience that the prospects were not bright for the repeal of this law, basing their opinion on the fact that both President Harrison and President Cleveland, before he was elected, favored the repeal of this law at the last session of Congress.

It is now known that there has been quite an undercurrent unfavorable to repeal of Senators who desired to be looked upon as favorably inclined toward the President, but who are free coinage men at heart, and assume a desire for repeal which does not exist, and who have no desire to reach a vote without something else equally favorable could be tacked on to the measure.

The delay affords an opportunity for some of the so-called majority (who profess to favor the law) to defeat it, unless a compromise is effected.

We are at the present time suffering less from the silver purchasing clause than we are from expending beyond our receipts, as the construction placed upon the indefiniteness of the law by Secretary Carlisle affords him the opportunity to purchase only that amount of silver at a price designated by him, based on London quotations at the time his offer was made.

There is no question that President Cleveland has the power to add to the gold reserve by selling bonds so far as is necessary to retain either the Government credit or the \$100,000,000 surplus, but as both he and Secretary Carlisle oppose that measure and refused the offer made early in April by New York bankers, they naturally prefer waiting for some action of Congress advising the sale of bonds to increase our Treasury surplus, which undoubtedly must be done at an early date if we desire to sustain our national credit.

Notes on Prices.

Wire Nails.—The Wire Nail market is in about the same condition as for the past week or two, and without evident improvement. There is, however, perhaps a slight increase in the demand, but orders are not placed with any freedom. Prices are substantially as at our last report—namely, \$1.30 for carload lots at mill. This quotation is quite general, and is but slightly shaded in exceptional cases, so that anything below this figure may be regarded as somewhat under the market. Some business is being done in anticipation of an early closing of navigation, but this fact has not as much effect as usual, inasmuch as the trade are very conservative in their purchases, and even the low prices ruling are not sufficient inducement to secure the placing of liberal orders.

Chicago, by Telegraph.—Manufacturers of Wire Nails report a considerably better inquiry and numerous sales of round lots. Quite a number of jobbers through the Northwest have realized the fact that navigation will close within the coming month and are now placing contracts in order to receive stock at the low freight rates prevailing by the water routes. The demand is also based to some extent on the very low prices ruling for Wire Nails and the belief that they are selling either at or below cost. They reason that this will compel a heavy curtailment of production in the near future and that it may possibly be followed by an advance in price. The inquiries and sales are for the most part for the month of November, but in some cases cover the whole period in-

tervening to the close of the year. There are some buyers who would like to contract at present prices for shipments running into next year, but manufacturers are not willing to make such terms. Prices on factory lots are still quoted at \$1.40 to \$1.45, Chicago, but these rates have been shaded on the largest quantities sold. Small lots from stock are quoted in a regular way at \$1.55, but a large part of the trade is done on the basis of \$1.50.

Cut Nails.—The volume of business in Cut Nails is light, but there has been no weakening in prices. The Eastern market is represented by the quotation of \$1 base on carload lots at mill and manufacturers are indisposed to make concessions, except in special cases. There are indications of a disposition on the part of Western mills to strengthen their prices somewhat, and in some cases extreme quotations have been withdrawn. As a result of this condition some of their most recent quotations name a slightly higher base or require a better average. This is not regarded as indicating the probability of an advance or any radical improvement in the tone of the market, but is rather a result of the conservative disposition on the part of the mills, who desire to obtain more remunerative prices. Small lots from store in New York are quoted at \$1.25 to \$1.30.

Chicago, by Telegraph.—The Cut Steel Nail trade is hardly in as active condition as the Wire Nail trade. Orders are still confined to small quantities, on which manufacturers continue to quote \$1.20 @ \$1.25. Jobbers quote small lots from stock at \$1.30.

Barb Wire.—The Barb Wire market continues weak and there is only a moderate volume of business. Manufacturers are desirous of securing orders and are going to the relatively small trade to a larger extent than usual, their business with the jobbers being this season comparatively light. Quotations are on a basis of \$2.25 to \$2.30 for Four-Point Galvanized, at mill, but these figures are sometimes slightly shaded. Painted is held regularly at 40 cents less.

Chicago, by Telegraph.—The Barb Wire business shows no improvement. Manufacturers are sending out their travelers and endeavoring to secure what trade they can, but reports thus far are not encouraging. Jobbers are doing very little in this branch of trade, and state that such business as is going is still handled almost entirely by manufacturers. Quotations are repeated on carload lots of ordinary Galvanized Barb Wire at \$2.40 and Glidden at \$2.50. Less than carload lots of ordinary Galvanized are quoted at \$2.55.

Hardware Shelf Boxes.—We give below the price-list of A. H. Green, successor to S. H. Green, 22 Park place, New York, covering the line of

Lock Corner Wood Boxes which he is manufacturing for the trade. These Boxes, it will be observed, are made so as to be interchangeable. The sizes given below are outside measurement and without covers. The list is as follows, subject to a discount of 50 per cent.:

No.	Long.	Wide.	High.	Each.
1.....	10½	x 3	x 3½	\$0.07
2.....	10½	x 4½	x 3½	.08
3.....	10½	x 6	x 3½	.09
4.....	10½	x 9	x 3½	.13
5.....	10½	x 12	x 3½	.16
7.....	10½	x 18	x 3½	.24
22.....	10½	x 4½	x 7	.11
23.....	10½	x 6	x 7	.14
24.....	10½	x 9	x 7	.18
25.....	10½	x 12	x 7	.24

To parties fitting up with new shelving Mr. Green suggests that if each division is made 36 inches wide, 7 inches between shelves and 10½ inches front to back, these boxes will completely fill them, either of one size or a variety of sizes in the same shelf. All the above sizes are carried in stock. Special sizes are also made to order in quantities of 50 and upward of a size.

A Screw case containing 80 drawers, furnished with chestnut knobs, is also made, the price being \$7.50 each, net. The size of the case is as follows: 29½ inches high, 25½ inches wide and 8½ inches front to back. Each drawer is intended to hold at least 1 gross of Screws.

Clippers.—Coates Clipper Mfg. Company, Worcester, Mass., whose Improved Barbers' Clippers were illustrated in a recent issue, are selling their Horse and Barbers' Hair Clippers from the following list, which is subject to a discount to the trade of 25 per cent.:

No.	Each.
2, One-hand Fetlock Animal Clipper.	\$2.00
4, Flat Spring Standard Toilet "	2.50
6, Spring Adjustable Toilet "	3.50
7, " Razor Toilet Clipper.	2.50
9, Two-hand Fetlock "	2.25
19, " Newmarket pattern Clipper	2.00
24, Adjustable Spring Bent Clipper....	3.00
27, " " " Razor Clipper.....	3.00
29, Hand-Power Horse Clipper.....	50.00
31, Adjustable Spring Toilet Clipper..	2.50
Adjustable Spring Toilet Clipper with sweat roll.....	3.00
31-0, Adjustable Spring Razor Toilet Clipper.....	2.50
Adjustable Spring Razor Toilet Clipper, with sweat roll.....	3.00
31-2, Adjustable Spring ¼-inch cut Clipper.....	3.00
31-3, Adjustable Spring 5-16-inch cut Clipper.	3.50
39, Two-Hand Anti-Friction Horse Clipper.....	3.00
41, Nulaval Toilet Clipper.	2.00
50, Steam, gas, water or electric power Clipper.....	75.00

Stove Truck.—The Lock Frame Stove Truck, manufactured by Randall & Ward, Le Roy, N. Y., and described in a recent issue, is sold to the trade at \$15 per dozen for the wood and \$18 per dozen for the steel.

Sheet Zinc.—The market for Sheet Zinc continues without change. The exceptionally low prices which are now ruling are due principally to the low price of Spelter and the inactivity of both the Spelter and Sheet Zinc markets. The demand for Sheet Zinc is, however, somewhat stimulated by

the reduced prices which are now prevailing, but the trade are not disposed to purchase much beyond their early requirements.

Cordage.—Within the past week there has been no quotable change in the price of Cordage, but the market is weak, and somewhat lower quotations can be obtained in special cases.

Glass.—Interest centers in the wage question rather than in the unchanged condition of the Glass market. It is reported that the Indiana Window Glass manufacturers representing 540 pots ask the Wage Committee to demand a greater reduction in wages than was asked by the committee at the last conference. This action was taken in view of the continued depression and unsatisfactory outlook for business, and the further decline in the price of imported Glass. Pittsburgh, Pa., manufacturers are represented as being prepared to stand by the Indiana Glass manufacturers in demanding a further reduction of wages. At the present time it is understood that there are something like 120 pots in operation throughout the country, but that none of these factories are members of the National Window Glass Association. Jobbers report the demand about the same, orders being for small quantities, and that orders are filled with imported Glass when American Glass of the desired sizes cannot be obtained. Grinders and polishers are at work on rough Plate Glass in manufacturers' hands to supply the demand, and there seems a probability of Plate Glass factories starting up before the first of the year. Quotations on all kinds of Glass are unchanged.

Export Notes.

THOMAS COOPER is now in charge of the Sydney and Melbourne offices of the Geo. F. Eberhard Company, having arrived out at Sydney July 21. Mr. Cooper has long been in the Australian trade, acting for a well known house in the colonies, but coming to Chicago on account of the exposition went back as one of the representatives of the Eberhard Company. He reports trade in somewhat better condition, and orders received by the New York branch through commission houses here indicate he is stimulating business to a satisfactory extent.

James E. Halsey, one of the oldest Hardwaremen in New York, sailed for Europe October 16 as the representative of Chas. B. Rouss on an extended trip through England, Germany, Sweden and Switzerland on business connected with the above concern.

E. Ahuja, one of the partners of Browne, Bêche & Co., Valparaiso, has returned to Chili. The above concern is but another name for the well-known house in this city of Hemenway & Browne, who are among the best known

drawers of South American exchange on Europe, having exported goods to the West Coast since 1829, largely on their own regular line of vessels.

Standard Axe & Tool Works, Ridgeway, Pa., are now represented in New York, Boston, Philadelphia, Pacific Coast and for export trade by Geo. F. Eberhard Company, 64 William street, New York. One grade of their Axes is known as the Black Eagle Brand, made of steel refined by a special chemical process. In addition to this brand a line of other Axes is made by the Standard Works.

New York merchants doing business with Australia refer to the last mail from that country as more satisfactory than those which have preceded it for some time, and look for even better results in the mail to arrive. Houses here supplying goods for Cuban consumption advise us of a considerable slackening off in trade with the Antilles; that while doing something all the time there is less snap to business than earlier in the year.

The Transvaal South African gold output steadily increases month by month, that for August, 1893, being 136,069 ounces as officially announced. The 1892 output was 1,250,000 ounces. With gold at \$16 per ounce this is a handsome export item of itself. Recently some 350 miners from Australia have arrived in two bodies; the influx of population from all sources continues to increase at a rapid rate; one railroad to the coast was completed in 1892 and two others will be completed in 1894.

World's Fair Awards.

The awards in Group 119, manufactures, including Vaults, Safes, Hardware, Edge Tools and Cutlery, are as follows:

Illinois—Chicago—William D. Gibson, Springs; Knickerbocker Ice Company, Ice Cutting and Distributing Tools; Chicago Spring Butt Company, Spring Hinges and Butts, Sliding Door Hinges; Wolf, Sayer & Heller, dried beef Cutters.

Pennsylvania—Philadelphia—McCaffrey File Company, Files and Rasps; Miller Lock Company, five awards, Padlocks, keyless Cabinet Locks, Night Latches, keyless Cabinet and Post Office Box Locks, Padlocks for railroad switches; Fayette R. Plumb, four awards, Edge Tools, Hammers, Sledges, Railroad, Miners' and Blacksmiths' Tools; Henry Diston & Sons, 31 awards, Files of every description for every purpose, Cross-Cut Saws, Hand Saws, Back Saws, Butcher Saws, Plumber Saws, Buck Saws, Hack or Machinist Saws, Pruning Saws, Compass Saws, Keyhole Saws, Plasterers' Trowels, Bricklayers' Trowels and tools, Carpenters' Squares, Carpenters' Bevels, Carpenters' Gauges, Spirit Levels, Machinists' Straight Edges, Machinists' Squares, Machinists' Rules, Wire Gauges, tools for keeping Saws in order, Saw Sets, Trammels, Hammers and Swage Bars, Straight Edges, Anvils, Gummars, Cane Knives, Post Hole Diggers, Screw Drivers.

Massachusetts—Boston—Atlas Tack Corporation, Tacks and Brads; Blount Mfg. Company, three awards, Door Checks, Springs and Stops, Sash Locks; Norton Door Check & Spring Company, automatic Door Checks and Springs; Simonds Mfg. Company, Fitchburg, three awards, Crescent ground Cross Cut Saw, Saw Sets; Barney & Berry, Springfield, Ice and Roller Skates; Northfield Knife Company, Northfield, Pocket Cutlery; Oliver Ames & Sons' Corporation, North Easton, four awards, Shovels, Spades, Scoops, Drainage Tools; Washburn & Moen Mfg. Company, Worcester, Builders' Hardware; J. R. Torrey Razor Company, Worcester, Razors; J. S. Thompson Mfg. Company, Waltham, Rivets for Shoe, Harness, Trunks, &c.; Charles Buck, Millbury, Edge Tools; Buck Bros., Millbury, Light Edge Tools, Chisels; Coburn Trolley Track Mfg. Company, Holyoke, Parlor, Barn and Fire Door Hangings; Snell Mfg. Company, Fiskdale, Boring Tools.

Rhode Island—Providence—American Screw Company, Wood and Machine Screws, Bolts and Rivets; Nicholson File Company, Files and Rasps, Filers' Specialties; Rhode Island Tool Company, four awards, Nuts, Wrenches, Turn Buckles, Drop Forging.

Connecticut—Russell & Erwin Mfg. Company, New Britain, four awards, Builders' Hardware, House Furnishing Goods, Screws, Bolts, Nails and Carpenter Tools; Eagle Lock Company, Terryville, Locks; G. J. Capewell, Hartford, three awards, combined Hammer and Nail Puller, improved Nail Puller, combined Hammer and Nail Puller; Hobart B. Ives & Co., New Haven, Sash Locks; Stanley Rule & Level Company, New Britain, Carpenters' Tools; Stanley Works, New Britain, Builders' Hardware.

New York—New York City—James Bardsley, Spring Hinges and Door Knobs; C. E. Jennings & Co., six awards, Augers, Bits, Drawing Knives, Saws, Planes, Carpenters' Tools; Kearney & Foot Company, Files and Rasps. Brooklyn—Bommer Bros., Spiral Spring Hinges; Wilson Bohannon, five awards, Locks, Padlocks, Switch Locks, Door Locks, Handles and Night Latches; N. Stafford, Stafford Coin Registering Bank.

Ohio—Cincinnati Tool Company, Cincinnati, Tools; Geneva Tool Company, Geneva, Hand, Farming and Garden Tools; Smith & Buckingham, Mount Vernon, Umbrella Locks; the Christy Knife Company, Fremont, Bread, Carving, Cake and Paring Knives; Clauss Shear Company, Fremont, three awards, Shears, Scissors, Bread, Cake and Paring Knives and Carvers; Van Wagoner & Williams Company, Cleveland, double and single Spring Hinges.

Other States—Withington & Cooley Mfg. Company, Jackson, Mich., Farm and Garden Tools; J. C. White, Waseca, Minn., Nail counter; E. T. Barnum, Detroit, Mich., Cheese Safes, Jail Cells; Stover Mfg. Company, Freeport, Ill., five awards, book holders, Hinges, Sash Pulleys and Locks, dictionary and book holders, double-acting Spring Hinges; J. H. Sternbergh & Son, Reading, Pa., five awards, Bolts, Rivets, Nuts, Washers, Screws; E. C. Atkins & Co., Indianapolis, Ind., three awards, Cross Cut Saws, Hand Saws, miscellaneous Saw Tools; Severance Nail Machinery Company, St. Paul, Minn., Nails and Spikes; Josiah J. Deal, Canton, Ohio, Combination Locks; C. S. Osborne & Co., Newark, N. J., Hammers, Plumb-

ers' and Saddlers' Tools; David Maydole Hammer Company, Norwich, N. Y., Hammers; L. A. Baker & Co., Elgin, Ill., Shingle Nail Machine; William Rose & Bros., Sharon Hill, Pa., Mechanics' Tools; De Mars Sash Lock Company, Albuquerque, Minn., Sash Locks; Grand Rapids Brass Company, Grand Rapids, Mich., Furniture Trimmings; Iowa Farming Tool Company, Fort Madison, Iowa, Hand Farming Tools, Hoes, Rakes and Forks; Lynch Mfg. Company, Madison, Wis., Lock Buckles; Hatch Cutlery Company, Milwaukee, Wis., Shears, Scissors, Pocket Cutlery and Knives.

In Group 117, Department of Manufactures, which covers Wire Goods and Screens, Perforated Sheets, Lattice Work, Fencing, &c., the following awards are announced:

Massachusetts—Clinton—Clinton Wire Cloth Company, five awards, Wire Cloth, Fancy and Galvanized Wire, Wire Nettings, Fencing, Wire Lath; Translucent Fabric Company, Translucent Fabrics, Transoms; Washburn & Moen Mfg. Company, Worcester, flat Steel Springs, round, angular and convex Card Wires, round Wire Springs.

Illinois—Chicago—N. P. Wilson, Horseshoes; United States Wire Mat Company, Decatur, Ill., Galvanized and Brass Wire Mats and Matting.

New Jersey—Trenton—Trenton Iron Company, three awards, Iron and Steel Wire, Telephone and Telegraph Wire, Spring Weaving Transparent Steel and Music Wire; New Jersey Wire Cloth Company, three awards, Wire Lath, Floor, Ceiling; John A. Roebling's Sons Company, Wire Rope, Cloth.

New York—Tiffany Glass & Decorating Company, New York, Glass and Metal Lath Work for windows, &c.

Ohio—The Baackes Wire Nail Company, Cleveland, Steel Billets; the Jones National Fence Company, Columbus, Wire Fencing.

Connecticut—Gilbert & Bennett Mfg. Company, Georgetown, Wire Cloth, Fencing and Fire Proofing.

Michigan—E. T. Barnum, Detroit, Wire and Iron Fences.

Maine—E. T. Burrows & Co., Portland, Wire Window Screens, Screen Doors.

New England Iron and Hardware Association.

THE REGULAR MEETING of the Boston Iron and Hardware Club was held Tuesday, October 10. It was decided to change the name of the club to the New England Iron and Hardware Association. The meeting was a pleasant and successful one, and the work of the association is progressing very satisfactorily. The credit bureau is referred to as working well, and gratification is also expressed that the case and cartage agreement is being carried into effect without serious difficulty and with but little opposition from the retailers.

WILLIAM H. QUINN of W. H. Quinn & Co., 103 Chambers street, New York, was nominated for State Senator by the Republican Senatorial Convention, which met October 16 in Brooklyn. Mr. Quinn is well known as the New York representative of several leading Hardware manufacturers, and is a member of the Hardware Club.

Trade Items.

GEORGE M. EDDY & CO., 345 to 353 Classon avenue, Brooklyn, N. Y., have a very complete display of Tape Measures in the northeast gallery, Column E, of the Manufactures Building, at the World's Fair. The exhibit is arranged in a handsomely furnished cherry showcase, and comprises a great variety of winding Tapes and spring Tapes of many sizes and in metal and leather cases, elegantly finished. The also exhibit Steel Tapes, loose Tapes of many kinds, Tailors' Measures, &c.

C. H. TUCKER, JR., agent, 114 Liberty street, New York, is representing as heretofore the entire line of goods made by the Wiley & Russell Mfg. Company, Greenfield, Mass., including Taps, Screw Plates, Tap Wrenches, Punches, Reamers, Mandrels, Swage Blocks, Tire Shrinkers, Drilling Machines, hand and power Bolt Cutters, &c. A full stock of these goods is carried by Mr. Tucker, who refers to this practice as having in the past brought him much business, owing to the promptness with which the goods can be supplied.

S. S. RASER, 40 North Sixth street, Philadelphia, announces, October 2, that he has purchased the entire Key stock of the late Geo. W. Pierce Company, and has removed it to his store, where he will carry on that line in connection with his present business. Mr. Raser states that he will be prepared to furnish many special Keys not usually found in stock. He is also equipping a plant for the manufacture of these goods. Mr. Raser will continue to handle Dog Collars and Muzzles, Roller and Ice Skates, Bicycle Sundries, Iron Toys, Silver Plated Ware, &c.

MERIDEN BRONZE COMPANY, 30 Park Place, New York, have lately supplemented their assortment of fine Lamps which are now offered for this fall's trade by the addition of a line of high-grade banquet Lamps, with cut and decorated Venetian glass columns, both in crystal and different shades of green. The metal parts are gold plated. The Venetian glass portion has been brought here on importation orders and this company, we are told, were granted the exclusive privilege of mounting these particular designs. There is also on exhibition a number of examples of fine decorated Japanese Pottery, mounted in solid brass, both plain and gold plated. This ware can be had incorporated in either banquet or piano Lamps.

ATTENTION IS DIRECTED to an advertisement in this issue of P. & F. Corbin, New Britain, Conn., and New York, in which liquid Door Checks and Springs are shown. For these goods the manufacturers claim easy adjustment, adaptability to all requirements, attractive appearance, satisfactory action and durability. The submersion of the Springs in lubricant is referred to as diminishing the friction incident to Springs when working against each other in a dry state. The lubricant thus adds to the efficiency of the device and to the ease with which doors are opened and closed upon which the Checks and Springs are used.

WILEY & RUSSELL MFG. COMPANY, Greenfield, Mass., have enlarged their line of full mounted Lightning Screw Plates by the addition of a number of sets. These goods are put up in hinged

wooden boxes in sets of five to nine sizes, with a stock to each die. The dies run in size from $\frac{1}{4}$ to 1 inch, with corresponding taps included in each set, five sets being put up in this manner. Each die is fitted permanently and rigidly in its own stock, with adjustment for wear or to make bolts fit tight or loose, permitting of the die wanted being at once available; and also allows every die in the set to be used at the same time, if necessary. Another feature of this arrangement is that every stock is proportioned to the strain likely to be put upon it, suited to the die it holds. These goods, we are advised, are offered at approximately 10 per cent. less than the former style, and that the quality of the die is the same. **C. H. TUCKER, JR.,** 114 Liberty street, New York, as agent, carries these goods in stock.

JOHN J. WIRTNER, secretary of the Geo. F. Eberhard Company, is here from San Francisco, getting posted on new goods for the present season and visiting some of the factories represented by his company. Incidentally he visited the Chicago Exposition on his way East.

H. D. HULL, dealer in Hardware, Troy, N. Y., has doubled the size of his store since it was damaged by fire in July, 1892, and is adding some lines of goods not carried before.

W. R. WALKLEY, New York manager of Peck, Stow & Wilcox Company, addressed the Hardware dealers at their dinner given October 11 in the United States Hotel, Boston. He spoke nearly an hour to about 65 people, among other things calling attention to the responsibility resting on the young men of this country during the next decade, not omitting to incorporate in his remarks some of his poetry prepared for the occasion. The address was greatly enjoyed by those who listened to it, and was heartily applauded.

S. L. ALLEN & Co., 1107 Market street, Philadelphia, have improved their line of Flexible Flyers, and have entirely remodeled their line of Flyer Sleighs. They have also added a new line of Flyer Coasters to their list, which they make in five sizes, from 30 to 48 inches in length.

THE STANLEY TACK WORKS, Belleville, Ill., have recently added to their line of tacks and small Nails a full line of Staples and double-pointed Tacks, which they furnish bright, blued coppered, galvanized and tinned. The assortment of Staples thus manufactured includes Steel Spring, Bed Spring, Electricians', Clamp, Hoop, Poultry Netting, Blind, Tube, Broom, Pail, &c.

IN OUR ISSUE of 5th inst., in referring to the Mowers of the Dille & McGuire Mfg. Company, Richmond, Ind., we mentioned that in the neighborhood of 50 of these machines were in use on the World's Fair Grounds. This statement was inaccurate inasmuch as the precise number of McGuire's Diamond Lawn Mowers furnished the Fair was 105. The company advise us also that their Mower was the only one officially used on the grounds.

WEBSTER R. WALKLEY, director and New York manager of the Peck, Stow & Wilcox Company, was nominated for alderman of the twentieth ward in Brooklyn, on the Republican ticket, by the Aldermanic Convention of the second district, which assembled Monday, October 16, at 151 Lawrence street in that city. As the

ward is normally Republican by a large majority the nomination is regarded as equivalent to an election.

CLENDENIN BROS., 111 South Gay street, Baltimore Md., are manufacturing a line of flat head improved brass Shoe Nails, referred to in their advertisement in this issue. The fact that these Nails are an improvement on those in general use is emphasized. These goods are put up, as shown in the illustration, in $\frac{1}{4}$ pound papers and telescope boxes of one dozen each; also in $\frac{1}{4}$ pound packages and in bulk, including all the regular sizes from $\frac{1}{8}$ to $\frac{3}{4}$. The firm also make corrugated brass Shoe Nails, and strive to give customers greater value by carefully sorting all the Nails. In addition to these goods they have a capacity for turning out 400 Soldering Coppers per day, making a specialty of the finish. They advise us that the finish is such that the Coppers hold their color for a long time on the jobbers' shelves, a fact which is appreciated by buyers. A specialty is made by this concern of brilliant finish cold rolled copper, to take the place of specially finished copper, without any extra cost than for ordinary finish.

N. R. STREETER & Co., Groton, N. Y., have recently made some changes in their business, by which its scope have been widened and their line of manufactures extended. They have lately put on the market some new goods, among which are Streeter's Sensible Mincing Knives of improved and special designs in one, two and six blades. They are also manufacturing the well-known Mrs. Potts' Sad Irons, together with an original improvement of their own on these goods; which they designate as Streeter's Sensible Cold Handle Pottstown Iron. The manufacture of their Streeter's Cold Handle Sensible Irons is continued, so that the firm's line of Irons is very complete. They are also making a novelty in the way of a Can Opener, known as the New Sprague. The Can Opener is entirely of metal, with the blades secured in the handle, and is nickel plated (dead finish) only. The point is made that the blade fits the slot closely, which causes it to cut tin easily. Some time since we announced that C. M. Avery, who is well known to the trade, had become the direct representative of N. R. Streeter & Co. Since then they have placed the marketing of their goods and the direction of their salesmen in his hands. Mr. Streeter will resume his trips to the Pacific Coast, and personally take charge of the interests of the firm west of the Rocky Mountains.

IN HIS ADVERTISEMENT appearing in Special Notices in this issue, J. H. Hillman, manager of the Pittsburgh Sales Agency, 8 Wood street, Pittsburgh, Pa., announces that that concern is now engaged in the sale and reorganization of manufacturing plants of various kinds. The statement is made that examinations and reports on properties are made and references furnished on application. We are advised that this firm during the past three months have met with considerable success, having effected the sale of three manufacturing properties, and are now conducting negotiations for the sale of a fourth one.

JOHN H. GRAHAM & Co., 113 Chambers street, New York, and New Departure Bell Company, have been appointed exclusive selling agents for the United States for the Lucas Bicycle Lamps, manufactured by Joseph Lucas & Son, Little King street, Birmingham England. They will carry a full line of

these Lamps at the above address, including the Holophote King of the Road, the Alumophote, the King's Own, the Kinglet, the King of the Road, the Pioneer, the Orient, the Club, the Pathfinder, &c.

THROUGH AN ERROR in *The Iron Age* of October 5 Andrews & Dawes were referred to as located at St. Johnsbury, Va., instead of Vermont. The firm have recently fitted up a store at St. Johnsbury, Vt., and are enjoying a good business. The store is 18 x 98 feet in size, with plate glass windows and all the modern improvements. Particular attention is given to window dressing, and their display attracts much attention, as it exceeds anything in this line that has been attempted in the town. The firm make a specialty of Cutlery, which they job and of which they carry a large stock. The shelves are fitted with boxes finished in Southern pine for Shelf Hardware, and a number of showcases are devoted to Cutlery and Tools.

Price-Lists, Circulars, &c.

THE FRED. J. MEYERS MFG. COMPANY, Covington, Ky.: Wire and Iron goods of every description, Bird Cages, Wire Cloth, genuine Hunter Sifters, Iron Fencing and Railing, Iron Shutters, Roof Cresting and Architectural Iron Work, Conductors' Punches, Hardware Specialties, &c. Their fall supplement, which is the first catalogue issued since the disastrous fire of March 5, 1893, by which their entire plant was completely destroyed, illustrates a portion of their goods with descriptions and list prices. A discount sheet accompanies the catalogue.

THE BUCHER & GIBBS PLOW COMPANY, Canton, Ohio: Columbian Catalogue of Gibbs' Imperial Plows. The front and back covers of the catalogue are printed in colors on tinted paper, showing among other things Plows on exhibition at the World's Fair dating from 1776 to 1893. The catalogue gives illustrations and descriptions of Plows, Harrows, Roller and Pulverizer.

COATES CLIPPER MFG. COMPANY, Worcester, Mass.: Coates' Clippers. Their catalogue illustrates power Clippers for animals, both hand and machine; parts and pieces of Clipper; counter and shaft; detail of flexible shaft; one-hand Fetlock Clippers, center-tension Magic Horse Clipper, Toilet Clippers, straight and bent, and Coates' Finger-Nail Cutter and Cleaner. Under the head of Motors suitable to run their power shaft are shown the Olin Gas Engine, Tuerk Water Motor, Crocker Wheeler Electric Motor, Kane's Regon Vapor Engine, and Lamb's adjustable animal power.

JULIUS ANDRAE, 225 West Water street, Milwaukee, Wis.: Electrical supplies. The aim in preparing the catalogue and price-list, it is stated, has been to make it complete in every particular, and at the same time compact and convenient to handle. Only those articles have been listed which have proven of practical value, and the catalogue has not been incumbered with useless material. The book contains 128 pages, the first part being devoted to Electrical House Goods, and the second part to Electric Light supplies.

MERIDEN BRITANNIA COMPANY, Meriden, Conn.; New York; Chicago; San Francisco; London, England; Hamilton, Canada: Gold and Silver

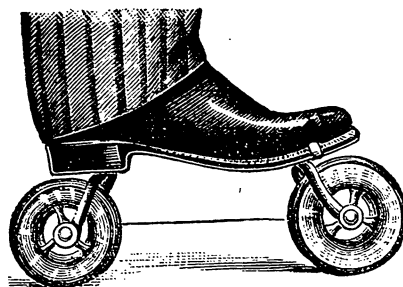
Plate. Their catalogue, No. 40, contains 130 pages, with handsomely designed cover, and finely illustrated on superior quality of paper. The illustrations show an assortment of their recent productions and most desirable patterns, without attempting to represent their line complete. The scale to which the illustrations are made is given under each heading to assist in determining the actual size of the articles. For convenience of sending telegraph orders a code word in brackets is attached to each price. The catalogue is filled with handsome designs in hollow and flat ware, toilet articles, desk bric-a-brac, &c.

THE ENTERPRISE MFG. COMPANY, Philadelphia, Pa.: A supplement for insertion in their May catalogue opposite page 48, covering Detachable Meat Hooks made under Charlton's patent.

T. F. WELCH & Co., 65 Sudbury street, Boston: Hardware and Tools, Gears and Gear Cutting. Their illustrated price-list for 1893-94 includes Gears, Chain Wheels, Knurls or Milling Wheels, Steel Wire Springs, pure Aluminum Graduated Rules, Lathe Dogs, Bench Lathes, Countershaft, Iron Pulleys, Thumb Screws, Hand Drilling Machine, Jewelers' Hand Drill Machine, Adjustable Hangers, &c. The manufacturers state that they have facilities for doing small work in metal, such as is required in experimental work, or in repairs of scientific and philosophical instruments.

Pneumatic Road Skates.

THE INCREASING USE of pneumatic tires is indicated in the accompanying cut, which shows them applied to Roller Skates. The Skates are arranged to clamp or strap on the soles of shoes like ordinary Skates, but the rollers are fitted with pneumatic



Pneumatic Road Skates.

tires. The rollers are fitted with ball bearings, and run noiselessly; the rollers being $3\frac{1}{4}$ inches in diameter, the tires 2 inches, and the average weight of each skate is $2\frac{1}{2}$ pounds. It is stated that the Skates meet all the requirements of road traveling, hills being surmounted and descended, while rough places are rendered smooth by the resiliency of the tire. The Skates are being made, we understand, by J. H. Wilson & Co., 9-13 High street, Kirkcaldy, Scotland.

Huntington-Hopkins Co.

SOME inaccurate and misleading reports have been published in the newspapers of the Pacific Coast, and have obtained some currency throughout the country, to the effect that Huntington-Hopkins Company of San Francisco are retiring from business. These reports, which go into some detail, mentioning the withdrawal of the prominent members of

the company and the selling of the company's business to other houses, are referred to as entirely erroneous. We are advised that no such changes have been determined upon and that the company expect to continue in business, maintaining their position as one of the leading jobbing Hardware houses of the country.

Death of William T. Nicholson.

AS WE GO to press we learn of the sudden death yesterday, from apoplexy, of William T. Nicholson, President of the Nicholson File Company, Providence, R. I. This intelligence will be received with sincere sorrow by the trade. Fitting reference to Mr. Nicholson's career as a business man and a manufacturer of exceptional ability and prominence we defer to our next issue.

Humason & Beckley Mfg. Company's Catalogue.

HUMASON & BECKLEY MFG. COMPANY, New Britain, Conn., and 80 Chambers street, New York, have just issued a catalogue, $8\frac{1}{2} \times 10\frac{1}{2}$ inches in size, containing 112 pages, bound in stiff cloth covers. The catalogue represents the Hardware and fine Pocket Cutlery manufactured by them, and includes illustrations, descriptions and list prices of Hammers, Saw Sets, Belt Punches, Cheese and Butter Tryers, Wrought Iron and Brass Spring Bolts, Rail Screws, Bright Iron and Brass Wire Goods, Wrought Goods, Ox Yoke Bow Pins, Box and Cotton Hooks, Nut Crackers, Corkscrews, Pocket Cutlery, &c. Some 22 pages are devoted to full size cuts of Corkscrews, which line has been enlarged and the designs improved. For the full sized illustrations and descriptions of Pocket Cutlery 48 pages are required. The makers state that the entire line of H. & B. Cutlery consists of about 600 numbers, and the illustrations are so clear that customers can order with even more facility from the catalogue than from samples.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

In the market for Paints and Colors the experience has been variable, a good volume of business being reported in some departments, while in others the movement continues slower than usual at this season of the year. Upon the whole, the conditions are about the same as they were a week ago and the outlook is without suggestion of any decided change in the immediate future. The cost of production of White Lead and domestic Oxide Zinc is undoubtedly reduced by the decline in prices of crude material. To some extent this fact, along with competition incidental to a quiet period, prompts concessions on prices of several specialties, but quotations for leading staples

are remarkably well maintained and the appearances are that distributors have thus far contended quite successfully against the several adverse market conditions. Compared with that of the preceding week, the volume of business has made a favorable showing in most departments.

White Lead.—Outside brands, otherwise the products of corrodors who stand entirely independent of the combine, are still selling at irregular prices, with 5½¢ the rule for round lots of dry Lead, and 6¢ for Lead in Oil. With Pig Lead at 3.35¢ @ 3.40¢ here, this shows a handsome profit. The manufacturers of mixed Leads and other cheap pigments put their prices correspondingly low, and while their old list has been continued in force by the National Company, it is claimed that special rates are still being made in quarters where competition is keenest. In short, the market is quite as ragged as it has been at any time during the past month or six weeks and the prospects are the reverse of encouraging for immediate improvement, since buyers operate in an extremely conservative manner.

Red Lead.—Dealings in foreign brands have been on a moderate scale and the demand from leading consumers is at present rather slow. The smaller buyers have purchased sparingly as well, and, upon the whole, the market has shown less spirit than usual at this season of the year. Practically the same remarks apply to the market for domestic product. Prices are no lower, but the market shows rather soft tone, particularly for the foreign brands.

Litharge.—The movement in low grade product employed in manufacturing industries continues moderately active and sufficient to keep prices quite steady. Higher grades that are used chiefly in the Paint trade do not fare relatively as well, as far as sales are concerned, but the business passing is chiefly at old prices.

Orange Mineral.—Barely the average purchases have been made during the past week, and the market at present is quiet. Prices are rather soft, but show no radical change.

Zincs.—Crude material is very cheap and leaves manufacturers of Oxide to fill contracts at prices somewhat below popular quotations. That special rates are made in remote instances is not improbable, but manufacturers generally quote the old range and claim that new orders are sufficient to keep the market in very good form. Foreign brands are quoted as before, but some jobbers still shade the official list a trifle.

Colors, &c.—Some lines of dry Colors used by grinders and in other manufacturing lines have been taken to a very fair extent, but the movement does not appear to be above the average for the season. The finer class of Dry and Oil Colors have met with merely routine sale, and trade in ready mixed Paints, with few exceptions, is represented as being somewhat disappointing, with prices low and irregular for other than strictly high grade goods.

Chalk, Whiting, &c.—Block Chalk has been quiet, and prices remain with out change. Whiting has met with rather freer sale, but supplies are ample, and business is effected easily at old prices.

Oils and Turpentine.

Few changes in prices have taken place, but those few were in the direction of a higher level, and it is only in the instance of some few minor articles that

the undertone of the market is not firm. Speculation is tame, export buyers are extremely conservative, and home distributors are moving cautiously in the absence of incentives to operations on a broad scale. It would seem, however, that distribution is sufficiently large to prevent anything in the nature of burdensome accumulation at first hands, and to this extent the conditions are more favorable for an upward turn in prices than for movement in the opposite direction.

Linseed Oil.—For the present, there is no lower quotation than 40¢ for local brands of raw Oil manufactured from American Seed, and on Western brands 39¢ is the popular quotation. Some of the non-combine brands of Western product could, however, probably be secured at 38¢ on net cash terms. Sales have been moderate and the demand at present is of strictly routine nature.

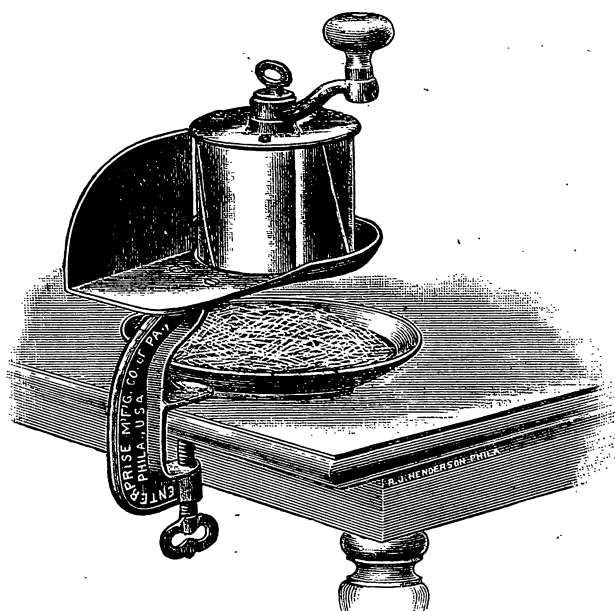
Cotton Seed Oils.—Western consumers have purchased quite freely of both

weakening prices to about 5½¢ for Ceylon and 6½¢ for Cochin in round lots. Mineral Oils are selling in routine way only, chiefly at old prices.

Spirits Turpentine.—The market is decidedly firmer under the influence of reports of better demand at various points and alleged reduction in the supply available for immediate shipment. Sales were made at 29¢ for regular and 29½¢ for machine barrels.

Enterprise New Slaw Cutter No. 94.

The Enterprise Mfg. Company of Philadelphia, Pa., are putting on the market a slaw cutter, as herewith shown. In operation the article to be sliced is placed on the platform, being fed or pushed gradually against the revolving cylinder, which contains three knives, the sliced product falling into a receiver underneath. The cutter is in-



Enterprise New Slaw Cutter No. 94.

crude and refined Oil for shipment in tank cars direct from the mills. Exporters have purchased sparingly, since foreign markets are well supplied. In other directions the movement has been commonplace. Such as it was, however, the movement served to turn a downward tendency in prices, and at present the market shows fairly firm tone, with prices standing just about as they were a week ago.

Lard Oil.—Prices have stiffened still further and 75¢ @ 77¢ is now the range of price for strictly prime present make Oil, with only out of town brands offered at the inside rate. Purchases are restricted with each advance in price and at the moment there is merely a routine business passing.

Fish Oils.—Further liberal sales of crude Sperm Oil have been made in the New Bedford market, but the movement has had no perceptible influence upon prices for refined product in the New York market. Whale Oils in general are quiet and unchanged. The same report will fittingly apply to Menhaden Oils and Cod Oil, there being merely routine movement.

Miscellaneous.—Common Oline Oil in barrels has been selling at about 60¢ on the spot and 55¢ @ 58¢ for future shipment, which prices indicate a rather soft market. Coconut Oils are offered rather more freely, with the effect of

tended especially for family use, but also for hotels, restaurants, provision dealers, farmers, &c. The manufacturers recommend the cutter for slicing potatoes—Saratoga chips, for instance—onions, cabbage, cucumbers, citron, &c., and for general slicing purposes.

THE WESTERN STEEL PROTECTED GLOVE MFG. COMPANY of Chicago have, at Column O 50, Machinery Hall, World's Fair, a novel exhibit, as well as one which attracts a great deal of attention in the shape of machinery for manufacturing gloves or mittens protected by steel staples. The leather of which the glove is to be made is first cut out. Then the machine takes the steel wire from the spool, and forming a staple over a steel form, it passes down and drives the staple through the leather, clinching it on the reverse side. The glove is fastened upon a frame which moves automatically as each staple is clinched, thus giving it a uniform appearance. They also have a second machine on exhibition, which sews the glove together by means of a steel wire and strap around the thumb, thus rendering it doubly durable. They use oil tanned calfskins entirely, and staples over the front of the hand and on the fingers make the goods very desirable for workmen having rough materials to handle.

The League Chainless Safety.

The accompanying cut represents the League chainless safety, manufactured by the League Cycle Company, Hartford, Conn. Instead of the usual chain and sprocket two bevel gears, adjusted on ball bearings, whose teeth are accurately cut by a special process, are incased in neat dust proof aluminum boxes in the center of the crank shaft bracket. To one of the gears is at-

labor and saves the rider the trouble and expense incident to loose and gritty chains. The machine is offered as high grade in every respect, and has the indorsement of experienced wheelmen as to its practicability.

Coal Shovel and Sifter.

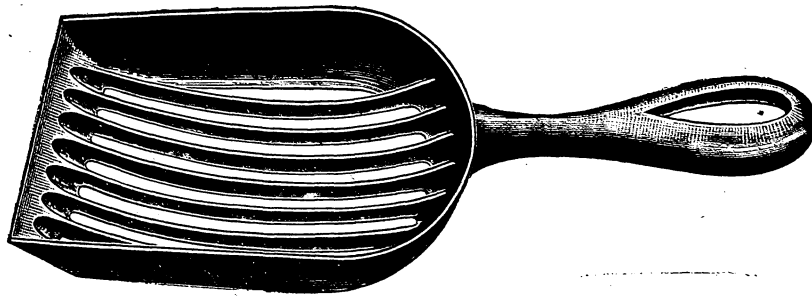
N. R. Streeter & Co., Groton, N. Y., are offering a coal shovel and sifter, as illustrated herewith. The shovel is



The League Chainless Safety.

tached a shaft that passes through the rear fork of the frame to the rear wheel, where it engages the teeth of two more gears, also incased in dust proof boxes. It is remarked that the gears are accurately adjusted, run in oil and are entirely concealed from view. The manufacturers claim for the wearing qualities of the gears that they will not break and that they will outwear the rest of the machine, also that there is no possibility of their getting out of alignment under the same proper usage as the ordinary chain and sprocket wheel receives. It is further explained that, in case of an accident, a side thrust coming against the vital part, the force would meet with more resistance owing to its coming in contact not only with the rear

made of cast iron, nicely japanned, 9½ inches long including the handle, and 4½ inches wide in the widest place. The openings between the ribs are about ⅜ inch, making it especially very valuable where pea coal is used. The shovel is designed for removing unburned coal from a stove or range when the fire has gone out, instead of dumping the whole mass, as the coal can be taken from the top of the fire box and sifted without raising dust. The point is made that enough coal can often be saved in this way to run a fire from after breakfast until the fire is needed at noon. The shape of the shovel is such that coal can be taken from between the magazine and the fire pot of a parlor or heating stove, a feature which will be



Coal Shovel and Sifter.

tubing of the frame, but also with the shaft concealed within; and that, should an accident occur, which would cripple an ordinary machine for use and occasion a long walk home, with the chainless safety it would not deprive the rider of the use of the wheel, though the force of the contact—meeting with the resistance already noticed—should spring the frame out of alignment for any reasonable amount of space. The manufacturers state that their wheel runs as easily as any in the market, climbs hills with one third less

appreciated by those whose fire has gone out with the magazine full of coal. The shovel is designed to retail for 10 cents.

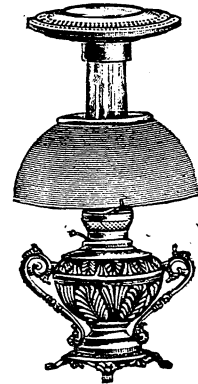
Pneumatic Oil Can.

Nail City Stamping Company, Wheeling, W. Va., for whom the Ross & Fuller Association, 33 Chambers street, are agents, are offering the Nail City Pneumatic 5-gallon oil can. The can is made of heavy galvanized iron, to

hold 5 gallons of oil, the oil being forced from the can by atmospheric pressure. By pressing down a plunger, the air forces the oil out by way of the spout, and when the pressure is released the oil ceases to flow. The spout, which is curved at the end, is jointed at the can, and when filling a lamp it is turned down to a horizontal position, so that the lamp is filled without lifting it from the table on which the lamp and can stand. The spout is also reversible, and when reversed the can, it is stated, is vapor proof, thus preventing the escape of gasoline or other vapors from the can. The point is made that the absence of a faucet for drawing lessens the liability of the oil or gasoline being tampered with by children.

The Merrill Heater.

Among the lamp stoves which are at present on the market that recently brought out by Randall & Becton of 19 India street, Boston, Mass., is illustrated in the accompanying cut, and is known as the Merrill. From an inspection of the engraving it will be seen that, generally speaking, the device consists of an ordinary fountain lamp, on the top of the



The Merrill Heater.

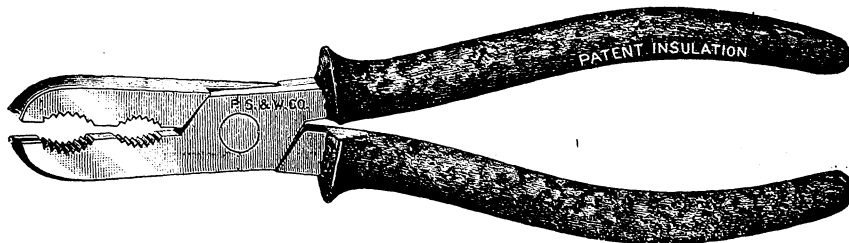
chimney of which is supported a shallow drum formed of two dished disks, joined at their outer edges and presenting the appearance shown. The top disk is perforated near its outer edge with nearly 300 small openings for the discharge of the heated air. The material employed is aluminum, which does not tarnish with use and which greatly resembles silver in its appearance. The lower disk is made of nickel plated brass with an opening for the introduction of the chimney top and is corrugated so as to allow for expansion and contraction. The drum is suspended upon the chimney top by means of hooks, which can be adjusted to suit varying sizes. A nickel plated collar loosely incloses the top of the chimney and permits the entrance of cool air into the drum, thus increasing the circulation. The manufacturers state that the device will not break chimneys nor cause soot or smell. They also claim that by the use of the Merrill heater the current of air is retarded in its upward progress, superheated and discharged in tiny streams into the surrounding atmosphere. The principal object of the construction employed is claimed to be the warming of the greatest volume of air in the shortest possible time.

Valves as applied to gas, water or steam fittings are commonplace enough, but such a contrivance in operation on

a horse is unusual. A horse belonging to Abeel Bros., iron merchants, 190 South street, was found to have a difficulty or obstruction in the head, which prevented him from obtaining a sufficient quantity of air through the regular channel. To supplement the supply of air it was found necessary to insert a metal valve consisting outwardly of a thin metallic disk about 2 inches in diameter, in which was a $\frac{1}{4}$ -inch round hole. This was placed some 15 to 18 inches down from the throat. Inside the disk was the necessary mechanism, with a counter flange to keep it in place.

Insulated Gas Pliers.

Peck, Stow & Wilcox Company, Southington, Conn., and 27 Chambers street, New York, are introducing insulated gas pliers, as illustrated herewith. The insulation with which the handles are covered is molded mica, mica being, it is understood, one of the best insulators known to modern science. The manufacturers state that the pliers will insulate against 1500 volts of electricity or even more; and that the mica will not chip or come off. The pliers are made in one size—7 inch—and are designed as a protection to those working

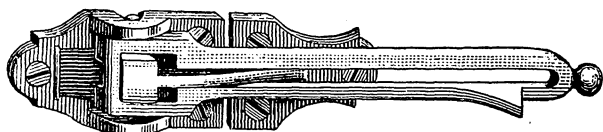


Insulated Gas Pliers.

about gas fixtures which are connected with electric wires.

Combined Door Lock and Ventilator.

The Brooklyn Specialty Company, 166 Pierrepont street, Brooklyn, N. Y., are offering this door lock with safety attachment and ventilator combined, as shown herewith. It consists of a plate and swinging hasp, which is screwed on the door jamb, and a plate and stationary bolt, which is screwed on to the door, in the positions shown in the cut. On the plate under the end of the hasp is a flat steel spring which holds the hasp at any angle and yet allows it to be moved by hand or by the action of the bolt as it slides along in the groove of the hasp as the door is opened or closed. For ventilation, notches on the under side of the head of the bolt engage with the offset near the outer end of the hasp. In this manner the door may be held open 4 or 5 inches. As long as the bolt is within the groove of the hasp any person outside the door is prevented from entering. When it is not desired to use the lock the hasp



Combined Door Lock and Ventilator.

may be swung back against the jamb, thus giving a person on the inside full control of the door, either to open or lock it without inconvenience and with the least effort. The hasp is $5\frac{1}{2}$ inches

long; the entire lock is nickel plated, neat in appearance and can be used on either right or left hand doors. The lock is designed as a substitute for the chain bolt, and the manufacturers claim that it is easily attached to a door, that there is no swinging chain to deface the door or jamb and that it is positive in its action.

Automatic Steam Coffee Cooker.

Wilnot Castle & Co., Rochester, N. Y., manufacture a coffee pot on the

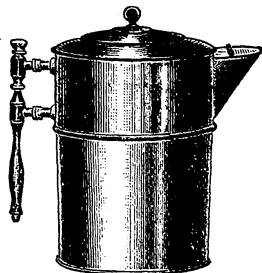


Fig. 1.—Automatic Steam Coffee Cooker.

same principle that is embodied in their Arnold automatic steam cooker. Fig. 1 shows a general view of the pot, while

Fig. 2 shows a sectional view through the pot and the steam cooking attachment. It is pointed out that coffee cooked with

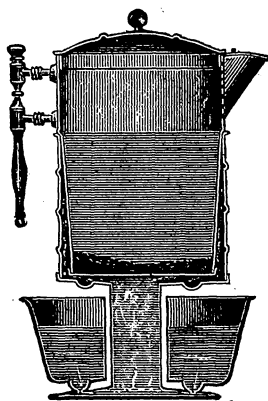


Fig. 2.—Sectional View through Pot and Steam Cooking Attachment.

steam at an unvarying temperature of 210° cannot boil, and it is therefore much better and more wholesome. The

the same manner. Urns for boarding houses and small hotels are also made on the same plan.

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Current Hardware Prices.

OCTOBER 18, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50¢ to 10¢ and 5¢ signifies that the goods in question are sold at prices ranging from discount 50¢ and 10¢ to discount 50¢ and 10¢ and 5¢.

Adjusters, Blind—

Domestic.....\$ doz \$3.00, 33¢ @ 33½¢ to 10¢
Excelsior.....\$ doz \$10.00.....60¢ to 10¢
North's.....\$ doz \$10.00.....60¢ to 10¢
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

Eagle Anvil, 7 lb 9¢.....15¢ to 15½¢
Peter Wright's.....11¢ to 11½¢
Armstrong's Horsehoe brand.....11¢ to 11½¢
Am. Wrought, Horsehoe brand.....11¢ to 11½¢
Trenton.....10¢ to 10½¢
Wilkinson's.....10¢ to 10½¢
Moore & Barnes Mfg. Co.....83¢ to 85¢

Anvil Vise and Drill—

Millers Falls Co., \$18.00.....20¢
Cheney Anvil and Vise.....25¢
Allen Anvil and Vise \$3.00.....40¢ to 10¢
Star.....45¢ to 55¢

Apple Parers—See Parers Apple, &c.

Augers and Bits—

Common Augers and Bits.....70¢ to 70½¢
Boring Machine Augers.....70¢ to 70½¢
Car Bits, 12-in. twist.....50¢
Russell Jennings' Augers and Bits.....25¢ to 10¢
Jennings' Pattern Car Bits.....40¢
Jennings' Pattern Auger Bits.....60¢ to 85¢
Snell's Bits.....60¢
C. E. Jennings & Co., No. 10, extension lip.....40¢
C. E. Jennings & Co., No. 30.....40¢
C. E. Jennings & Co., Auger Bits, ½ set, 32¢ quarters, No. 5, 8; No. 30, \$3.50.....25¢
Lewis' Patent Single twist.....20¢
Fugh's Black.....30¢
Fugh's Jennings Pattern.....30¢
L'Hommedieu Car Bits.....15¢ to 10¢
Fornster Pat. Auger Bits.....15¢
Cincinnati Bell-Hangers' Bits.....30¢ to 10¢

Bit Stock Drills—

Morse Twist Drills.....50¢ to 10¢
Standard.....50¢ to 10¢
Cleveland.....50¢ to 10¢
Syracuse, for metal.....50¢ to 10¢
Syracuse, for wood (wood list).....30¢ to 10¢
Cincinnati, for wood.....30¢ to 10¢
Cincinnati, for metal.....45¢ to 10¢

Expansive Bits—

Clark's small, \$18; large, \$26, 35¢ to 35½¢
Ives' No. 4, ½ doz \$60.....40¢
Swan's.....40¢
Steer's No. 1, 2; No. 2, \$18.....35¢ to 40¢
Steer's No. 2, \$48.....20¢

Gimlet Bits—

Common.....\$ gross \$2.75 to \$3.25
Diamond.....\$ doz \$1.25.....40¢ to 10¢
Bee.....25¢ to 25½¢
Double Cut.....45¢ to 45½¢
Shepardson's.....30¢ to 10¢
Ct. Valley Mfg. Co.....30¢ to 10¢
Hartwell's.....\$ gro, \$10.00.....40¢ to 10¢
Dougllass.....40¢ to 10¢
Ives.....60¢ to 60½¢

Hollow Augers—

Ives'.....33½¢ to 33½¢
French, Swift & Co. (Beecher).....\$10¢
Bonney's Adjustable, ½ doz \$48.....50¢
Stearns'.....20¢ to 10¢
Ives' Expansive, each \$4.50.....60¢ to 5¢
Universal Expansive, each \$4.50.....20¢
Wood's.....25¢ to 25½¢
Cincinnati Adjustable.....25¢ to 10¢
Cincinnati Standard.....25¢ to 10¢

Ship Augers and Bits—

L'Hommedieu's.....15¢ to 10¢ to 15¢ to 10¢
Watrous'.....25¢ to 25½¢
Snell's.....25¢ to 25½¢
Snell's Ship Auger Pat'n Car Bits.....15¢ to 10¢ to 15¢ to 10¢

Awl Hafts—See Hafts, Awl.

Awls—

Awls, Sewing, Common.....\$ gr. 85¢ to 90¢
Awls, Should. Peg.....\$ gr. 1.50 to \$1.55
Awls, Pat. Peg.....\$ gr. 35¢ to 38¢
Awls, Shouldered Brad.....\$ gr. \$1.30 to \$1.40
Awls, Handled Brad.....\$ gr. \$2.50 to \$3.00
Awls, Handled Scratch.....\$ gr. \$4.00 to \$4.50
Awls, Socket Scratch.....\$ doz. \$1.10 to \$1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands.....\$7.00 Beveled.....\$7.50
First qual., other brands.....8.75
Second quality.....5.50 6.00

Axle Grease—See Grease, Axle.

Axles—

No. 1.....34¢ to 44¢, No. 2, 5¢ to 8¢
Nos. 7 to 15.....60¢ to 10¢
Nos. 15 to 28.....47¢ to 70¢
Nos. 19 to 22.....70¢
Concord Axles, loose collar.....44¢ to 66¢
Concord Axles, solid collar.....54¢ to 77¢
National Tubular Self Oiling.....33½¢ to 33½¢ to 55¢

Bag Holders—See Holders, Bag.

Balances—

Spring Balances.....40¢
No. 2000.....30¢
Chatillon, ½ doz.....\$0.80 0.95 1.75 net
Chatillon Straight Balances.....40¢
Chatillon Circular Balances.....50¢ to 10¢

Barb Wire—See Wire, Barb.

Bars—

Crow—
Cast Steel.....\$ doz 3½¢
Iron, Steel Points.....\$ doz 3½¢

Basins, Wash—

Standard Fiberglass, No. 1, 10½-in., \$1.80;
12-inch, \$2.00; 13½-inch, \$2.50; 15-inch, \$3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82.....50¢ to 10¢
Chatillon's No. 1.....40¢
Chatillon's No. 2.....40¢
Custer's.....33½¢ to 35¢

Beaters—

Egg—
Dover.....\$ doz \$1.00 to \$1.20
Duplex (Standard Co.).....\$ doz \$1.00
Dover (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.).....\$ gro, No. 0 \$12.00; No. 1, \$15.00; No. 2, \$36.00
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00
Triple (H. & R. Mfg. Co.).....\$ gro \$16.50
Spiral.....\$ gro \$4.25 to \$4.50
Improved Acme (H. & R. Mfg. Co.).....\$ gro \$9.00
Silver & Co.....\$ doz \$5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20¢

Bells—

Cow—
Common Wrought.....60¢ to 10¢
Western, Sargent's list.....70¢ to 10¢
Kentucky, "Star".....20¢ to 10¢
Kentucky, Sargent's list.....70¢ to 10¢
Kentucky Durham.....70¢ to 10¢
Dodge, Genuine Kentucky.....70¢ to 10¢
Texas Star.....50¢ to 10¢ to 50¢ to 10¢

Door—

Gong, Abbe's.....33½¢ to 10¢
Gong, Yankee.....45¢ to 10¢
Gong, Barton's.....40¢ to 10¢ to 50¢
Crane, Brooks'.....50¢ to 10¢ to 2¢
Crane, Cone's.....10¢
Crane, Cone's.....20¢ to 10¢
Lever, Sargent's.....60¢ to 10¢
Lever, Taylor's Bronzed or Plated.....net
Lever, Taylor's Japanned.....25¢ to 10¢
Lever, R. & E. Mfg. Co.'s.....50¢ to 10¢ to 2¢
Pull, Brooks'.....50¢ to 10¢ to 2¢

Electric—

Wollensak's.....20¢
Bigelow & Dowse.....20¢

Hand—

Light Brass.....70¢ to 10¢ to 70¢ to 10¢ to 5¢
Extra Heavy.....70¢
White.....70¢
Silver Chains.....33½¢ to 70¢
Globe Cone's Patent.....25¢ to 10¢ to 35¢

Miscellaneous

Call.....45¢ to 50¢
Farm Bells.....\$ doz 3¢ to 3½¢
Steel Alloy Church and School Bells.....40¢

Bellows—

Blacksmiths'.....60¢ to 10¢ to 60¢ to 10¢ to 10¢
Molders'.....40¢ to 10¢ to 50¢
Hand Bellows.....40¢ to 10¢ to 50¢

Belting, Rubber—

Common Standard.....75¢ to 75½¢ to 10¢
Standard.....70¢ to 70½¢ to 10¢
Extra.....60¢ to 10¢ to 60¢ to 10¢ to 10¢
N.Y.B. & P. Co., Carbon.....60¢ to 60½¢
N.Y.B. & P. Co., Diamond.....50¢ to 50½¢
N.Y.B. & P. Co., Para.....40¢ to 40½¢

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters.....15¢
Detroit Perfect Tire Bender.....15¢
Green River Tire Benders and Upsetters.....20¢

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron.....60¢ to 10¢
Moore's Novelty, Mal. Iron.....55¢
Sure Grip Steel Tackle Block.....85¢
See also Machines, Hoisting.

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....80¢ to 80½¢
Genuine Eagle, Norway, list Oct. '84.....80¢ to 80½¢
Eagle, Norway, list Oct. '84.....80¢ to 80½¢
Phila. pattern, list Oct. 7, '84.....80¢
R.B. & W., old list.....70¢
Machine, list Jan. 1, 1890.....80¢ to 10¢
Bolt Ends, list Jan. 1, 1890.....80¢ to 10¢

Door and Shutter—

Cast Iron Barrel, Square, &c.....70¢ to 10¢
Cast Iron Shutter Bolts.....70¢ to 10¢
Cast Iron Chain (Sargent's list).....65¢ to 10¢
Ives' Patent Door Bolts.....60¢ to 10¢ to 80¢
Wrought Barrel.....70¢ to 10¢ to 75¢
Wrought Square.....70¢ to 10¢ to 75¢
Wrt Shutter, all iron, Stanley's.....60¢ to 10¢ to 80¢ to 10¢ to 10¢
Wrt Shutter, Brass Knob.....50¢ to 50½¢
Wrt Shutter, Sargent's list.....60¢ to 10¢
Wrt Sunk Flush, Sargent's list.....60¢ to 10¢
Wrt Sunk Flush, Stanley's list.....50¢ to 10¢ to 55¢
Wrt B. K. Flush, Common.....65¢ to 10¢

Stove and Plow—

Stove.....60¢ to 10¢ to 80¢ to 10¢ to 10¢
Plow.....60¢ to 10¢ to 60¢ to 10¢ to 10¢
R. B. & W., Plow.....55¢

Tire—

Common, list Feb. 28, '83.....65¢ to 65½¢
Port Chester Bolt and Nut Company.....65¢
Empire list Feb. 28, '83.....65¢
Keystone, Philadel., list Oct. '84.....70¢
Norway, Phila., list Oct. '84.....75¢
American Screw Company.....75¢
Norway, Phila., list Oct. 16, '84.....75¢
Eagle, Phila., list Oct. 16, '84.....80¢
Philadel., list Oct. 16, '84.....80¢
Bay State, list Feb. 28, '83.....65¢
R. B. & W., Philadel., list Oct. 16, '84.....80¢

Borers, Tap—

Common and Ring.....20¢ to 10¢
Ives' Tap Borers.....33½¢ to 35¢
Enterprise Mfg. Co.....20¢
Clark's.....33½¢ to 35¢

Borax—

Per lb.....9¢ to 10¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon—

Per box.....24¢
Boxes, Miter.....20¢
Spilker's Excelsior, 3 in. \$7.50, 4 in. \$8.50, 5 in. \$13.00, 6 in. \$15.00.....20¢

Braces—

American Bit Brace and Tool Co.....60¢ to 10¢
Nos. 10, 12, 20.....60¢ to 10¢
Nos. 11, 21, 24, 27.....70¢ to 10¢
Nos. 22, 23, 25.....60¢ to 10¢ to 5¢
Nos. 12, 26, 36, 37.....70¢ to 10¢ to 5¢
Amidon's.....75¢ to 10¢ to 80¢
Barker's Imp'd Plain.....75¢ to 10¢ to 80¢
Barker's Imp. Nickeled.....65¢ to 10¢ to 70¢
Ratchet.....75¢ to 10¢ to 80¢
Eclipse Ratchet.....60¢
Globe Jaded.....40¢ to 40½¢
Conover Brace.....40¢ to 40½¢
Universal, 8 in., \$2.10; 10 in. \$2.25.....\$1.10 to \$1.15
Buffalo Ball.....50¢ to 10¢
Barber's.....50¢ to 10¢
Saxton's.....75¢ to 10¢ to 80¢
Barker's Imp. Polished.....75¢ to 10¢ to 80¢
Barker's Nickeled.....\$1.00 to \$1.10
Ratchet, Polished.....50¢ to 10¢ to 60¢
Ratchet, Nickeled.....40¢ to 10¢ to 50¢
Buffalo Ball.....net, \$1.10 to \$1.15
Bartholomew's.....50¢ to 10¢ to 60¢ to 5¢
Nos. 25, 27 and 30.....50¢ to 10¢ to 60¢ to 5¢
Nos. 117, 118, 119.....70¢ to 70½¢
Common Ball, Amer.....\$1.00 to \$1.10
Fray's Genuine Spotted.....50¢ to 50½¢ to 10¢
Fray's Nos. 70 to 120, 81 to 123, 207 to 414.....50¢ to 10¢
Ives' New Haven Novelty.....70¢ to 70½¢
New Haven Ratchet.....60¢ to 60½¢ to 10¢
Barber Ratchet.....60¢ to 60½¢ to 10¢
Barber's.....60¢ to 60½¢ to 10¢
Hale Casters.....60¢ to 60½¢ to 10¢
P. S. & W. Co., Peck's Patent.....60¢
Rose & Johnson.....50¢
Davis Patent.....50¢ to 10¢

Brackets—

Shelf, plain.....65¢ to 70¢
Regular, list.....60¢ to 10¢ to 70¢ to 10¢
Sargent's list.....70¢ to 70½¢
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70¢ to 10¢

Bright Wire Goods—See Wire.

Broilers—

Hens' Self-Inch.....9 10 9x11
Basting.....\$ doz. \$4.50 5.50 6.50
New Haven.....50¢
Wire Goods Co.....65¢ to 10¢
Morgan Odorless.....\$ doz. \$12.50
Queen City.....33½¢

Buckets, Well—

Galvanized—
Hill's.....\$ doz. 12 qt. \$4.25; 14 qt. \$5.25
Iron Clad.....\$ doz. 14 qt. \$4.25 to \$4.50
Helwig's Flat Iron Band.....\$3.75
Helwig's Wired Top.....\$ doz \$4.00

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butcher's.

Butts—

Brass—
Wrought Brass.....80¢ to 50¢ to 10¢
Cast Brass, Tiebout's.....50¢
Cast Brass, Fast.....33½¢ to 10¢
Cast Brass, Loose Joint.....33½¢ to 10¢

Cast Iron—

Fast Joint, Narrow.....50¢ to 10¢ to 50¢
Fast Joint, Broad.....50¢ to 10¢ to 50¢
Loose Joint.....50¢ to 10¢ to 50¢
Loose Joint, Japanned.....75¢ to 75¢
Loose Joint, Jap. with Acorns.....75¢ to 75¢
Parliament Butts.....75¢ to 75¢
Mayer's Hinges.....75¢ to 75¢
Loose Pin, Acorns.....75¢ to 75¢
Loose Pin, Acorns, Japanned.....75¢ to 75¢
Loose Pin, Acorns, Japanned, Plated Tips.....75¢ to 75¢

Wrought Steel—

Fast Joint, Narrow.....50¢ to 10¢ to 50¢
Fast Joint, Lt. Narrow.....50¢ to 10¢ to 50¢
Fast Joint, Broad.....50¢ to 10¢ to 50¢
Loose Joint, Broad.....50¢ to 10¢ to 50¢
Table Butts, Back Flaps, &c.....50¢ to 10¢ to 50¢
Inside Blind, Regular.....50¢ to 10¢ to 50¢
Inside Blind, Light.....50¢ to 10¢ to 50¢
Loose Pin.....50¢ to 10¢ to 50¢
Bronzed Wrought Butts.....50¢ to 10¢ to 50¢

Cages, Bird—

Hendryx, Brass or Enameled.....50¢ to 10¢
Hendryx, Wood.....40¢ to 10¢

Calipers—See Compasses.

Calks, Toe—

Gautier, One Prong, Blunt.....54¢ to 6¢
Burke's One Prong, Blunt.....54¢ to 6¢
Burke's, Two Prong, Blunt.....74¢ to 8¢
Burke's, One Prong, Sharp.....64¢ to 7¢

Can Openers—See Openers, Can.

Cans, Milk—

S. S. & Co.: 5-gal., \$3.00; 8-gal., \$4.40;
10-gal., \$4.75 each.....40¢ to 10¢

Cans, Oil—

Galvanized Blue Band, 5 gal., Tip-Top.....\$ doz. \$12.00
Galvanized Blue Band, 5 gal., Faucet.....\$ doz. \$8.00
Galvanized Blue Band, 1 gal., \$ doz. \$2.25
Glass Oil, Friend.....\$ doz. \$2.75

Caps—

Percussion—
Hicks & Goldmark's and Union Metallic Cartridge Co.....\$1000
F. L. Waterproof, 1-10's.....35¢ to 37¢
E. B. Trimmed Edge, 1-10's.....47¢ to 50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47¢ to 50¢

Musket, Waterproof, 1-10's.....50¢ to 53¢
G. D.....27¢ to 30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....56¢ to 58¢
Eley's D Waterproof, Central Fire.....\$1.60

Primers—

Berdan Primers, \$1.00.....2¢
B. L. Caps (Sturges Cast Shells) \$1.00.....2¢
All other Primers, \$1.20.....2¢

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....25¢

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Rim Fire Cartridges.....50¢ to 52¢
Rim Fire Military.....15¢ to 2¢
Cent. Fire, Pistol and Rifle.....25¢ to 25¢
Cent. Fire, Military and Sporting.....15¢ to 52¢
Blank Cartridges, except 22 and 32 cal., additional 10¢ to above discounts.
Blank Cartridges, 22 cal., \$1.76.....2¢
Blank Cartridges, 32 cal., \$3.50.....2¢
Primed Shells and Bullets.....15¢ to 52¢
B. B. Caps, Round Ball, \$1.76.....2¢
B. B. Caps, Con. Ball, Swgd., \$2.00.....2¢

Carpet Sweepers—

See Sweepers, Carpet.

Casters—

Bed.....Brass.....55¢ to 55½¢ to 10¢
Plate.....Others.....60¢ to 60½¢
Shallow Socket.....40¢ to 10¢
Deep Socket.....40¢ to 10¢
Martin's Patent (Phonetic).....45¢ to 10¢ to 50¢ to 10¢
Tucker's Patent, low list.....45¢
Payson's Anti-friction.....70¢ to 70½¢
Payson's Truck.....60¢ to 60½¢ to 10¢
Yale Casters, low list.....45¢
Yale, Gem.....70¢
Giant Truck Casters.....35¢
Stationary Truck Casters.....50¢ to 10¢
Socket Truck Casters.....50¢ to 50½¢ to 10¢
Gwinner's Common Sense.....45¢
Gwinner's Hercules.....45¢

Cattle Leaders—

See Leaders, Cattle.

Cement—

Victor Elastic.....5 lb pails \$ 5 5¢
Chain—
Trace, Wagon and Fancy Chains, list revised May, 1893.....60¢ to 60½¢ to 10¢
American Coll, in bags.....\$ 16 5¢
\$ 7.60 5.30 4.45 3.30 3.60 3.40 3.25
Less than cash lots, add 4¢ to 5¢
German Coll, list July 12, 1892 6¢ to 60¢ to 10¢
German Halter Chain, list July 12 1892.....60¢ to 60½¢ to 10¢

Covert Halter.....60¢ to 60½¢
Cover Traces.....55¢ to 52¢
Cover Heel Chain

Halters—

Cover's Rope, Jute.....	60&10&10&25
Cover's Rope, 7 1/2 in. Jute.....	70&25
Cover's Rope, 1 1/2 in. Hemp.....	50&25
Cover's Adj. Rope Halters.....	40&25
Cover's Hemp Horse and Cattle Tie.....	50&10&25
Cover's Jute Horse Ties.....	70&25
Cover's Jute Cattle Ties.....	70&10&25
Cover's Adj. Web Halters.....	35&25
Cover's Saddlery Works Halters.....	38&25
Cover's Saddlery Works Horse and Cattle Ties.....	83&25
Cover's Saddlery Works Handy Web Halters.....	33&25

Hammers—

Handled Hammers—	
Maydole's, Hist Dec. 1, '85.....	25&10&35
Buffalo Hammer Co.....	50&10
Humason & Beckley.....	50&10
Atha Tool Co.....	40&10
Verree.....	40&10
C. Hammond & Son.....	40&10
Fayette R. P. & Co., E. Nall.....	40&10
Artisan's Choice, A. E. Nall.....	50
Regular Y. & P. A. E. Nall.....	50
Horsehoe Turning Hammers.....	50
Other Hammers.....	50&10
Cheney's Claw.....	40&10
Cheney's Machinist's & Riveting.....	40&10
Magnetic Tack, Nos. 1, 2, 3, 4.....	1.50 & 1.50
Nelson Tool Works.....	40&10
Warner & Nobles, new list.....	25&10
Peck, Stow & Wilcox.....	35&40
Sargent's.....	40&10

Heavy Hammers and Sledges—

3 lb and under.....	75&10
3 to 5 lb.....	85
Over 5 lb.....	85
Wilkinson's Smiths.....	10&11

Handcuffs and Leg Irons—

See Police Goods.

Handles—

Cross-Cut Saw Handles—	
Atkins' new list.....	40
Champion.....	15
Ely's Perfection.....	15
Sensible.....	40

Iron, Wrought or Cast—

Door or Thumb.....	0
Nos.....	1 2 3 4
Per doz.....	0.90 1.00 1.08 1.35 1.50
Roggin's Latches.....	60&10
Bronze Iron Drop Latches.....	70
Jap'd Store Door Handles—Nuts, 1.12; Plate, 1.10; no plate, 0.88.....	10&10
Barn Door.....	10&10
Chest and Lifting.....	70&10

Wood—

Saw and Plane.....	40&10
Hammer, Hatchet, Axe, &c.....	40&10
Brad Axl.....	20
Hickory Firmer Chisel, ass'd.....	4.50
Hickory Firmer Chisel, large.....	5.00
Apple Firmer Chisel, ass'd.....	6.00
Apple Firmer Chisel, large.....	6.00
Socket Firmer Chisel, ass'd.....	3.00
Socket Framing Chisel, ass'd.....	5.00
J. B. Smith & Co.'s Pat File.....	50
File, assorted.....	2.75
Auger, assorted.....	5.00
Auger, large.....	7.00
Pat. Auger, 17.....	30&10
Pat. Auger, Douglass.....	1.25
Pat. Auger, Swan's.....	1.00
Hoe, Rake, Shovel, &c.....	60&10

Hangers—

Barn Door, old patterns.....	70&10
Barn Door, New England.....	70&10
Samson Steel Anti-Friction.....	55
Orleans Steel.....	55
Hamilton Wrought Steel Track.....	55
Champion.....	60&10
Climax Anti-Friction.....	55
Zenith for Wood Track.....	50&10
Sterling.....	50&10
Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....	50&25
Kidder's.....	60&10
Boss.....	60&10
Best Anti-Friction.....	60&10
Duplex (Wood Track).....	60&10
Terry's Modern.....	60&10
Terry's Ideal.....	60&10
Terry's Solid.....	60&10
Terry's Shield.....	60&10
Terry's Wrought Single Strap.....	60&10
Cronk's Patent, Steel Covered.....	60&10
Carrier Steel Anti-Friction.....	80&10
Richards'.....	80&10
Lane's New Standard.....	50&10
Lane's Standard.....	50&10
Lane's Parlor.....	40
Warner's Pat.....	20&10
Stearns' Anti-Friction.....	20&10
Stearns' Challenge.....	25&10
Cincinnati Nos. 1, \$2.25; 2, \$2.50; 4, \$2.50.....	20&10
Paragon Nos. 5, 5 1/2, 7 and 8.....	20&10
Resistant.....	60&10
Nickel, Steel, Nos. 0, \$25; 1, \$20; 2, \$15.....	40&10
Chicago Anti-Friction.....	40&10
Star.....	30&10
Barry.....	60&10
Interstate.....	60&10
Pendulum, Payson's.....	40&10
Moody.....	45
Economy, \$5.00.....	60&10
Perfection.....	60&10
Lundy, Steel Pair.....	50&10
Matchless.....	50&10
Magic.....	45&10
Wild West.....	45&10
Moore's Elevator.....	33&25
Moore's Baggage Car Door.....	33&25
Moore's Railroad.....	55

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.....	
Blood's.....	40 & 10
Hunt's.....	40 & 10
Hurd's.....	40 & 10
Mann's.....	40 & 10
Peck's.....	40 & 10
Underhill's.....	85
Fayette R. Plumb.....	
C. Hammond & Son.....	
Kelly's.....	
Buffalo Hammer Co.....	50 @ 50
Sargent's & Co.....	& 10
P. S. & W. Co.....	
Schulte, Lohoff & Co.....	
Ten Eyck Edge Tool Co.....	
Collins.....	10

Hay and Straw Knives

See Knives.

Hinges—**Blind Hinges—**

Parker.....	75
Huffer.....	50
Clark's Nos. 1, 3, 5, 40 and 50.....	80&5
Clark's Mortise Gravity.....	50
Sargent's Nos. 1, 3, 5, 11, 12, 13, 75&10	
Reading's Gravity.....	75&10
Shepard's.....	75&10
Noiseless.....	75&10
Niagara.....	30
Buffalo.....	30
Clark's Genuine Pattern.....	30
O. S., Lull & Porter.....	75&10
Acme, Lull & Porter.....	75
Queen City Reversible.....	70&10
Clark's, Lull & Porter, Nos. 0, 1, 1 1/2, 2, 2 1/2, 3.....	75&10
North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....	10

Gate Hinges—

Western.....	60
N. E.....	60
N. E. Reversible.....	60
Clark's, Nos. 1, 2, 3.....	60
N. Y. State.....	60
Automatic.....	60
Shepard's.....	60

Spring Hinges—

Geer's Spring and Blank Butts.....	40
Union Spring Hinge Co's list.....	40
March, 1886.....	20
Barker's Double Acting.....	25
Empire and Crown.....	25
Bommer's Japanned.....	35
Bommer's All other Kinds.....	30
Buckman's.....	15
Chicago.....	30
Bardley's Patent Checking.....	15
Acme.....	30
U. S.....	25
Hero and Monarch.....	55
American, Gem and Star.....	20
Oxford.....	20
Royal.....	60
Reliable.....	60
Champion.....	60
No. 25 Unbreakable.....	60
J. G. C. Covered, \$30.....	50
Samson.....	60
Wiles, No. 1, \$10; No. 2, \$13.....	13
Devore, No. 1.....	13
Rex.....	13
Prescott.....	12
New Idea Nos. 1 and 10.....	13
New Idea Dbl. Acting.....	45
Ideal No. 3.....	10
Stearns' Noiseless Floor Hinge, \$ set, \$5.00.....	20

Wrought Iron Hinges—

List February 14, 1891.....	
Strap and T.....	50&10
Corrugated Strap and T.....	50&10
Screw Hook and T.....	12 in. 4
Strap.....	12 to 20 in. 3
Screw Hook and Eye.....	12 in. 3
Roller Blind Hinges, Nos. 32 and 34.....	60&10
Roller Blind Hinges, Nos. 252 and 254.....	55&10
Roller Plate.....	70&10
Roller Raised.....	70&10
Plate Hinges (8, 10 & 12 in. 5	
"Providence" over 12 in. 5	

Hoes—

D. & H. Scovill.....	20
Lane's Crescent Planters' Pattern.....	45
Lane's Razor Blade, Scovill Pattern.....	30
Maynard, S. & O. Pat.....	45
Sandusky Tool Co., S. & O. Pat.....	60
Am. Axe and Tool Co., S. & O. Pat.....	60
Chattanooga Tool Co., S. & O. Pat.....	60
Grub.....	60

Eye—

Garden, Mortar, &c.....	70
Planter's, Cotton, &c.....	70
Warren Hoe.....	60
Magic.....	40

Hog Rings and Ringers—

See Rings and Ringers.

Holisting Apparatus—

See Machines, Holisting.

Hollow-Ware—

See Ware, Hollow.

Holders—**Bag—**

Sprengle's Pat.....	18
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Bit—

Extension.....	40
Barber's.....	40
Ives.....	40
Diagonal.....	40
Angular.....	40

File and Tool—

Bals Pat.....	40
Nicholson File Holders.....	20

Sash—

Motley's Adj. Sash, Medium Size.....	1.20
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Hooks—

Cast Iron—	
Bird Cage, Sargent's list.....	60
Bird Cage, Reading.....	60
Clothes Line, Sargent's list.....	60
Clothes Line Moore's.....	70

Line, Reading list.

Celling, Sargent's list.....	55
Harness, Reading list.....	55
Coat and Hat, Sargent's list.....	55
Coat and Hat, Reading.....	55
Coat and Hat, Moore's.....	70

Wrought Iron—

Cotton.....	1.25
Cotton Pat. (N. Y. Mallet and Handle Wks.....	30
Tassel and Picture, T. & S. Mfg. Co.....	50
Wrought Staples Hooks, &c.....	See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....	60
Wire Coat and Hat, Miles, list April, 1886.....	60
Indestructible Coat and Hat.....	45
Wire Coat and Hat, Standard.....	60
Heavy Hat and Coat.....	60
Steady Ceiling Hooks.....	60
Belt.....	80
Atlas, Coat and Hat.....	80
Williamson's Bird Cage Hooks, list April, 1892.....	40
Bright Wire Goods—See Wire.	

Miscellaneous—

Grass, No. 2, \$2.00; No. 3, \$2.10; No. 4, \$2.25.....	25
Nolin's Grass.....	25
Bush.....	65
Whiffletree—Patent.....	65
Hooks and Eyes—Malleable Iron.....	70
Hooks and Eyes—Brass.....	60
Fish Hooks, American.....	60
Bench Hooks—See Bench Stops.	

Horse Nails—See Nails, Horse**Horse Shoes—**

See Shoes, Horse.

Hose, Rubber—

Competition, Fair quality.....	75
Competition, Low Grade.....	80
Standard.....	70
Extra.....	60
N. Y. B. & P. Co., Para.....	25
N. Y. B. & P. Co., Extra.....	40
N. Y. B. & P. Co., Dundee.....	60
Cotton Garden, 1/4 in., coupled.....	7
Fair Quality, 1/4 in.....	7
Good Quality, 1/4 in.....	8

Huskers—

Blair's Adjustable.....	7
Blair's Adjustable Clipper.....	7
Hubbard's Solid Steel.....	4.50

Indurated Fiber Ware—

See Ware, Indurated Fiber.

Irons. Sad—

From 4 to 10, at factory.....	100
Self-Heating.....	2.30
Self-Heating Tailors'.....	2.80
Mrs. Potts' Sad Irons, per set.....	18.00
No. 50.....	65
No. 55.....	65
No. 60.....	65
No. 65.....	65
Crown Improved.....	60
Ideal Irons, new list.....	50
Salamanca Irons.....	25
B. S. Bad Irons.....	30
Chinese Laundry (N.E. Butt Co.).....	15
New England.....	20
Mahony's Troy Pol. Irons.....	30
Sensible, list Jan. 91.....	50
Sensible Tailors' Irons.....	30
National Self-Heating.....	30

Soldering—

Soldering Coppers.....	19
Cover's Adjustable, list Jan. 1, 1893.....	85
Tinker's Dred.....	1.75

Pinking—

Pinking Irons, \$ doz. 55 @ 60.

Jack Screws—See Screws.**Jacks, Wagon—**

Daisy.....	33
Victor.....	33
Lockport.....	40

Kettles—

Bas, Spun, Plain, list Jan. 1, '91.....	25
Frass, Spun, Plid. W. M. list Jan. 1, '91.....	20
Stamped Brass Kettles.....	21
Enameled and Tea—See Ware, Hollow.	

Keys—

Lock, Ass'n list Dec. 30, 1886.....	65
Erie Cabinet, &c.....	33
Hotchkiss' Brass Blanks.....	40
Hotchkiss' Copper and Tinned.....	40
Hotchkiss' Pad and Cab.....	35
Wollensack Tinned.....	50

Knife Sharpeners—

See Sharpeners, Knife.

Knives—

Wilson's Butcher Knives, list Dec 8, 1890.....	25
Ames' Butcher Knives.....	25
Foster Bros' Butcher, &c.....	40
Jordan's A. A. Butcher's, list.....	40
Nichols' Butcher Knives.....	40
W. W. Wilson, Butcher, 6 in., \$2.00; 7 in., \$2.70; 8 in., \$3.80, &c.....	25
Ames' Shoe Knives.....	25
Ames' Bread Knives.....	1.50
Moran's Shoe and Bread.....	20
Hay and Straw—See Hay Knives.	
Table and Pocket—See Cutlery.	

Corn—

Bradley's.....	10
Wadsworth's.....	25

Drawing—

Witherby.....	75
P. S. & W.....	75
Mix.....	75
New Haven.....	60
Merrill.....	60
Douglas.....	75
Watrous.....	15

L. & J. J. White.....	20
Bradley's.....	25
Adjustable Handle.....	25
Wilkinson's Folding.....	25

Hay and Straw—

Lightning, from jobbers.....	8.00
Wadsworth's.....	40
Carter's Needle.....	1.50
Heath's.....	13.00
Nolin's Hay.....	7.00

Mincing—

Britain, Graham & Mathes, list Jan. 1890..... 60&10&10%
Plate..... 33&42%
Barnes Mfg. Co..... 40&40&10%
Yale..... net prices
Deitz Flat Key..... 38%
Romer's Night Latches..... 15%
Brooklyn Latches..... 50&10%
Warner's Burglar Proof..... 50% doz. \$3.00, 50%

Elevator—

Moore's..... 33&42%

Padlocks—

List June 10, 1891..... 50&2%
Norwich Lock Mfg. Co., old list..... 50&2%
Yale Lock Mfg. Co.'s..... net prices
Eagle..... 40%
Romer's Eagle Lock Co..... 40&2%
Romer's Nos. 0 to 91..... 50%
Romer's Scandinavian, &c., Nos. 100 to 505..... 15%
A. E. Deitz..... 40%
Champion Padlocks..... 40%
Hotchkiss..... 30%
Star..... 60%
Horseshoe..... 50% doz. \$0.50, 50&40&10%
Barnes Mfg. Co..... 40&40&10%
Nook's..... 30%
Scandinavian..... 90&40%
E. T. Frahm's Keystone Scandinavian, 1010 line..... 90&40%
120 line..... 90&25%
109 line..... 70&10%
510 line..... 70&10%
225, 610 and 209 lines..... 70%
All other numbers..... 50&5%
Ames Sword Co. up to No. 150..... 40%
Ames Sword Co. above No. 150..... 50%
Slaymaker, Barry & Co..... 90&5%
No. 41 line..... 50%
No. 61 line..... 60%
No. 21 line..... 80%

Sash, &c.—

Clark's No. 1, 110, No. 2, 33 gr..... 33&42%
Ferguson's..... 33&42%
Victor..... 60&10&2%
Walker's..... 10%
Attwell Mfg. Co..... 25&33&42%
Reading..... 60&10&60&10&10%
Hammond's Window Springs..... 40%
Common Sense, Jap'd, Cop'd..... 40%
Br'zed..... gr \$4.00
Common Sense, Nickel Plated..... gr \$10.00
Universal..... 30%
Kempshall's Gravity..... 60%
Kempshall's Model..... 60&60&10%
Corbin's Daisy, list Feb. 15, 1888..... 60%
Payson's Perfect..... 60&10&10%
Hugunin's Sash Balances..... 25&5&2%
Hugunin's New Sash Locks..... 25&5&2%
Ives' Patent..... 60&10&5&60&10&10%
Fish Luesche's (pat.), No. 100, gr..... 33%
No. 105, gr..... \$1.00
Davis Bronze, Barnes Mfg. Co..... 60%
Champion Safety list January, 1893..... 70&5%
Security..... 70%
Giant, list Jan., 1892..... 70&5%
Wolcott's..... 60&10&5%
Monarch..... 50%

Lumber Tools—

See Tools, Lumber.
Lustro—
Four-ounce bottles..... doz. \$1.75; gr \$17.00

Machines.

Boring—

Without Augers. Upright. Angular.
Douglas..... \$5.50 \$6.75..... 50%
Snell's, Rice's Pat..... 5.50 6.75 40&10&10%
Jennings..... 5.50 6.75 60&50&5%
Other Machines..... 2.25 2.50..... 35%
Phillip's Patent
with Augur..... 7.00 7.50..... 25%
Millers Falls..... 7.50..... 25%
Boss, Carpenters' 3.00
Boss, Ship Bldrs' 3.85

Fluting—

Knox, 4 1/2-inch Rolls..... \$3.25 each } 35%
Knox, 6-inch Rolls..... \$3.60 each }
Eagle, 3 1/2-inch Rolls..... \$2.15..... 35%
Eagle, 4 1/2-inch Rolls..... \$2.35..... 35%
Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$0.50 each..... 35%
Crown Jewel, 6 in., \$3.50 each, 35%
American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each..... 35%
Domestic Fluter..... each, \$1.50
Geneva Hand Fluter, White Metal..... doz \$12, 25%
Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00, 4, \$8.25..... 30%
Shepard Hand Fluter, No. 85, per doz..... \$15.50
Shepard Hand Fluter, No. 110, doz..... \$11.00
Shepard Hand Fluter No. 95, doz..... \$8.00
Combined Fluter and Sad Iron..... doz \$15.00..... 40%
Combined Fluter..... doz \$15.00..... 30%

Holting—

Moore's Hand Hook, with Lock Brake..... 20%
Moore's Anti-Friction Differential Pulley Block..... 20%
Moore's Rope Differential Pulley Block..... 60%
Energy Mfg. Co.'s..... 25%
See also Blocks.

Washing—

Anthony Wayne, doz, No. 1, \$42; No. 2, \$48; No. 3, \$42..... doz \$38.00
Wayne American..... doz \$38.00
Western Star, doz, No. 2, \$36; No. 3, \$33..... doz \$54.00
Fair and Square..... doz \$42.00

Mallets—

Hickory..... 20&10&20&10&10%
Lignumvite..... 20&10&20&10&10%
B. & L. Block Co., Hickory & L. V..... 30&30&10%
Mattocks—Regular list..... 60&10&60&10&5%

Measures

Standard Fireware, No. 1, peck doz, \$3.50; 1/2-peck, \$3.00

Meat Cutters—

See Cutters, Meat.

Menders, Harness—

Per doz..... \$2.00

Milk Cans—See Cans, Milk.

Mills—

Coffee—
Box and Side, list Jan. 1, 1888..... 60&60&5%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893..... 20%
The Swift, Lane Bros..... 20%
Waddell's New Box Mills, Ideal Brand, New List..... 60%

Mincing Knives—

See Knives, Mincing.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Best Machines: 10-in., \$4; 12-in., \$4.50; 14-in., \$5; 16-in., \$5.50; 18-in., \$6.
Low-Grade Machines:
10-in. \$3; 12-in., \$3.25 14-in., \$3.50 each

Muzzles—

Safety..... doz, \$3.00, 25%

Nails—

Cut and Wire. See Trade Report.
Wire Nails, Papered..... 85&5%
Association list, May 1, '92..... 70&60&10%
Tack Mfrs' list..... 70&60&10%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

American..... 9 10
Nos. 6 9 1/4 9 3/4 9 1/2 net
Ausable..... 25 26 25 24 23

Clinton, Fin., 19 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Essex..... 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Lyra..... 9 1/4 9 1/2 9 3/4 9 1/2 net
Standard..... 23 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Vulcan..... 23 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Northwestern..... 25 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

C. B. K..... 25 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
A. C..... 25 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Maud S..... 25 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Champlain..... 28 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Champion..... 25 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Capwell..... 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Anchor..... 23 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Western..... 23 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Empire Bronzed..... 13 12 11 10 9 8 7 6 5 4 3 2 1

Picture—

Brass Head, Sargent's list..... 60&60&10%
Brass Head, Combination list..... 60&10%
Porcelain Head, Sargent's list..... 50&10&10%
Porcelain Head, Combination list..... 40&10%
Niles' Patent..... 40%

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail.

Nut Crackers—

See Crackers, Nut.

Nuts—List Dec. 18, 1899.

Hot Pressed..... 5.80 6.50 off list
Cold Punched..... 5.00 6.10 off list
In packages of 100 lb, add 1-10¢ lb, net; in packages less than 100 lb, add 1/2¢ lb, net.

Oakum—

Best or Government..... doz 6¢ 7 1/2¢
U. S. Navy..... doz 5¢ 6 1/2¢
Navy..... doz 5¢ 6 1/2¢

Oil Tanks—See Tanks, Oil.

Oilers—

Zinc and Tin..... 65&10&70&5%
Brass and Copper..... 50&10&50&10&5%
Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4.00; No. 3, \$4.40 doz..... 10&10&5%
Malleable, Hammers' Old Pattern, same list..... 45%
Prior's Pat. or "Paragon" Zinc..... 60&10&10%
Prior's Pat. or "Paragon" Brass..... 60%
Olmstead's Tin and Zinc..... 60%
Olmstead's Brass and Copper..... 60%
Broughton's Zinc..... 50%
Broughton's Brass..... 50%
Steel, Draper & Williams..... 50%
Wilmet & Hobbs Mfg. Co., Steel Anti-Rust..... 60%

Openers, Can—

Messenger's Comet..... doz \$3.00, 25%
American..... doz \$2.75, 30%
Duplex..... doz \$2.50, 15&20%
Lyman's..... doz \$3.75, 20%
No. 4, French..... doz \$2.25, 55&60%
No. 5, Iron Handle..... gr \$6.00, 45&50%
Eureka..... doz \$2.50, 10%
Sardine Scissors..... doz \$2.75, 30%
Star..... doz \$2.75
Sprague, No. 1, \$2.00; 2, \$2.25; 3, \$2.50; 4, \$2.75..... 60&40%
Excelsior, No. 1 \$2.50; No. 2, \$1.50..... 40%
World's Best..... gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00..... 50&10%
Universal, doz \$3.00..... 55&5%
Domestic, doz \$2.00..... 45%
Champion, doz \$2.00..... 50%
Moore's..... doz \$2.00..... 70%

Packing, Steam—

Rubber—
Standard, fair quality..... 70&70&10%
Inferior quality..... 75&80%
Extra..... 60&60&20%
N. Y. B. & P. Co., Standard..... 50%
N. Y. B. & P. Co., Empire..... 50%
N. Y. B. & P. Co., Salamander..... 50%
Jenkins' Standard, 8 in doz..... 25&25&5%

Miscellaneous—

American Packing..... 10¢ 11¢ 12¢
Russian Packing..... 13¢ 14¢
Italian Packing..... 15¢ 16¢
Cotton Packing..... 15¢ 17¢
Jute..... 7¢ 8¢ 9¢

Pails—

S. S. & Co.: 18 qt., \$7.00; 20 qt., \$7.25
doz..... 5%

Galvanized—

Quarts 10 13 14
Hill's Light Weight, doz. \$2.75 3.00 3.25
Hill's Heavy Weight, doz. 3.00 3.25 3.75
Sidney Shepard & Co..... 2.50 2.75 3.00
Central Stamping Co..... 2.50 2.75 3.00
Iron Clad..... 2.50 2.75 3.00
Fire Buckets..... 2.75 3.25 3.50
Buckets—See Well Buckets.

Indurated Fiber Ware

Star Pails, 12 qt..... doz \$4.20
Milk, 14 qt..... doz \$5.40
Stable, 14 qt..... doz \$3.00
Fire Pails, doz..... doz \$4.80
Fire Pails, round bottom..... doz \$5.40

Standard Fiber Ware—

Water Pails, 12 qt., Plain, Deord'd..... doz \$3.15 \$3.75
Dairy Pails, 14 qt., doz..... 3.75 4.25
Fire Pails, No. 1, 12 qt., doz..... 3.75 4.25
Fire Pails, No. 2, 14 qt., doz..... 4.25 6.00
Sugar Pails..... 5.50 6.00
Horse Pails..... 4.50 6.00
Buggy Pails..... 3.50 6.00
Slop Jars (gal, trap)..... 7.50 8.50
Chamber Pails, 14 qt..... 6.00 7.00

Pans—

Dripping—
Small sizes..... doz 5¢
Large sizes..... doz 5¢
Silver & Co. (Covered)..... 40%

Fry—

Standard List:
No..... 1 2 3 4 5
doz..... \$3.00 \$3.75 \$4.25 \$4.75 \$5.25
No..... 5 6 7 8 9
doz..... \$6.00 \$7.00 \$8.00 \$9.00 \$10.00
Polished, regular goods..... 75¢ 75¢ 10¢
Acme Fry Pans..... 60&4%

Dust—

Steel Edge, No. 1..... doz \$1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, \$2; 20, \$2.25; 30, \$2.50 each..... 60&10%

Paper and Cloth—

Sand and Emery—
List April 19, 1888..... 60&10&50&10&10%
Sibley's Emery and Crocus Cloth..... 30%

Parers—

Apple—
Advance..... doz \$4.75
Baldwin..... doz 5.25
Bonanza..... each 5.00
Daisy..... doz 4.00
Dandy..... each 7.50
Eclipse..... doz 4.00
Eureka, 1888..... each 18.00
Favorite..... doz 12.00
Family Bay State..... doz 6.00
Gold Medal..... doz 4.00
Ideal..... doz 4.00
Improved Bay State..... doz 27.00 30.00
Little Star..... doz 4.50
March..... doz 13.50
New Lightning..... doz 5.50
Orion..... doz 4.00
Penn..... doz 3.00
Perfection..... doz 4.00
Pomona..... doz 4.00
Rocking Table..... doz 6.00
Turn Table..... doz 4.50
Victor..... doz 13.50
Waverly..... doz 4.00
White Mountain..... doz 4.00
Reading 72..... doz 4.25
Reading 78..... doz 7.00

Potato—

White Mountain..... doz \$4.50
Antrim Combination..... doz \$5.50
Hoosier..... doz \$13.50
Saratoga..... doz \$5.50

Pencils, Soapstone—

See Crayons.

Pickers, Fruit—

Prize Fruit Pickers..... 50%

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00..... 60&10&5&60&10&10&5%

Picture Nails—

See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—

Bow—
Humason, Beckley & Co.'s..... 60&10%
Sargent & Co.'s, \$17 and \$18..... 60&10%
Peck, Stow & W. Co..... 50&10&50&10&5%
Escutcheon—
Iron, list Nov. 11, 1885..... 50&10&50&10&5%
Brass..... 60&80&5%

Pipe, Wrought Iron—

List April 13, 1893.
1 1/2 and under, Plain..... 57&10%
1 1/2 and under, Galv..... 60&10%
1 1/2 and over, Plain..... 67&10%
1 1/2 and over, Galv..... 67&10%
Boiler Tubes, list Oct. 24, 1892..... 65&10%
Casing, list Nov. 16, 1892..... 62&10%
Inserted Joints Casing, list Nov. 16, 1892..... 47&5%
Steel Boiler Tubes..... 27&5%
Cold Drawn Seamless Steel Tubing..... 50%

Planes and Plane Irons—

Wood Planes—
Molding..... 40&10%
Bench, First quality..... 45&10%
Bench, Second quality..... 50&10%
Bailey's (Stanley R. & L. Co.)..... 50&10%

Iron Planes

Bailey's (Stanley R. & L. Co.)..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.)..... 25&10%
Stanley Iron Planes..... 60&50&5%
Skerden Mal. Iron Co..... 60&50&5%
Davis' Iron Planes..... 60&50&5%
Birmingham Plane Co..... 60&50&5%
Gage Tool Co.'s Self-Setting..... 20&10&10%
Chaplin's Iron Planes..... 60&50&5%
Sargent's..... 60&50&10%
Standard Tool Co..... 60&50&5%

Plane Irons—

Butcher's..... \$5.00 to \$5.25 to 30
Buck Bros..... 30

Auburn Thistle..... } 30&10&30&10&10%
Ohio..... }
Sandusky..... 25%
L. & J. White..... 25%
Stanley R. & L. Co..... 50&10%

Plates—

Fellose..... doz 6¢ 6 1/2¢ 4¢

Pliers and Nippers—

Button's Patent..... 60%
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in., \$21.00 doz..... 40%
Humason & Beckley Mfg. Co. 50&50&10%
Lindsay's Giant..... 33&42%
Gas Pliers..... 60%
Gas Pliers, Custer's Nickel Plated..... 60&5%
Eureka Pliers and Nippers..... 40%
Russell's Parallel..... 25%
P. S. & W. Cast Steel..... 50&50&5%
P. S. & W. Tinners' Cutting Nippers..... 10%

Carow's P. Wire Cutter..... 20%
Morrell's Parallel, doz \$12.00..... 30&5%
Cronk's 5 in., \$15.00, 12 in., \$20..... 30%
Cronk's Button Pattern..... 50&10&00%
Cronk's Carrier Pliers..... 60&60&5%

Plumbs and Levels

Regular List..... 75&10&75&10&10%
Stanley's Duplex..... 20&10%
Stanley's Handy..... 20&10%
Diston's..... 40&10%
Cook's..... 70&10&70&10&10%
Pocket Levels..... 30%
Davis Iron Levels..... 10&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, doz..... 33&42%
No. 1, \$6.00; No. 2, \$9.00..... 33&42%
Silver & Co., 6-Ring, doz, \$4.00; 3-Ring..... \$2.00

Pokes, Animal—

Bishop's I. X. L..... doz \$6.00
Bishop's Monarch..... doz \$4.50
Bishop's Pioneer..... doz \$4.00
Bishop's American..... doz \$3.00
Eagle, Double Stale..... doz \$5.75
Eagle, Single Stale..... doz \$3.75
Buckeye, Single Stale..... doz \$2.75
Belmont..... doz \$6.00
Metallio Horse Pokes..... doz \$6.00

Police Goods—

R. I. Tool Co., Handcuffs, \$15.00 doz 10¢
R. I. Tool Co., Leg Irons, \$25.00 doz 10¢
Silver & Co., 6-Ring, doz, \$4.00; 3-Ring..... \$2.00

Pokes, Animal—

Bishop's I. X. L..... doz \$6.00
Bishop's Monarch..... doz \$4.50
Bishop's Pioneer..... doz \$4.00
Bishop's American..... doz \$3.00
Eagle, Double Stale..... doz \$5.75
Eagle, Single Stale..... doz \$3.75
Buckeye, Single Stale..... doz \$2.75
Belmont..... doz \$6.00
Metallio Horse Pokes..... doz \$6.00

Pillars Nail-

Scranton \$ doz. \$18.00, 88¢
 Giant, No. 1 \$ doz. \$18.00, 10¢
 Giant, No. 2 \$ doz. \$18.00, 10¢
 Pelican \$ doz. \$9.00, 25¢
 Eclipse \$ doz. \$24.00, 40¢
 Economy \$ doz. \$6.00

Pulleys-

Hot House, Awning, &c. 60¢ to 70¢
 Japanned Screw 60¢ to 10¢
 Brass Screw 60¢ to 10¢
 Japanned Side 60¢ to 10¢
 Moore's Side, Anti-Friction 60¢
 Moore's Ceiling or End, Anti-Friction 60¢
 Moore's Dumb Waiter, Anti-Friction 60¢
 Moore's Electric Light 35¢
 Japanned Clothes Line 60¢ to 10¢
 Hay Fork, Solid Eye, 5 in. solid \$4.50
 Hay Fork, "Anti-Friction," 5 in. solid \$7.00
 Hay Fork, "F" Common and Patent Bushed 20¢
 Hay Fork, Tarbox Pat. Iron 20¢
 Hay Fork, Head's Self-Lubricating 60¢
 Hay Fork, Moore's Anti-Friction 5 in. Wheel, 3 Jaws, \$12.00 40¢
 Shade Rack 45¢
 Tackle Blocks-See Blocks.
 Sheppard's Niagara, No. 25, 1 doz 23¢ net
 Sash (Auger Mortise) 60¢
 Common Sense 60¢
 Empire 60¢
 Ideal, Nos. 2, 4, 10 & 15, 90% less 1¢
 Acme doz net.
 Star
 On bbl. lots extra 5¢.
 Ideal, Nos. 25 and 55, 1 doz. 22¢ net.

Pumps-

Cistern, Best Makers 60¢ to 10¢
 Fitcher Spout, Best Makers 37¢ to 70¢
 Fitcher Spout, Cheaper G'ds. 75¢ to 10¢

Punches-

Saddler's or Drive, good, 1 doz., 60¢ to 65¢
 Bemis & Call Co.'s Cast Steel Drive 50¢ to 55¢
 Bemis & Call Co.'s Springfield Socket 55¢
 Spring, good quality, 1 doz., \$2.50 to \$3.00
 Spring, Leach's Pat. 15¢
 Bemis & Call Co.'s Spring 50¢ to 55¢
 Bemis & Call Co.'s Check 50¢
 Solid Tinnings, P., S. & W. Co., 1 doz., \$1.44
 Tinnings' Hollow Punches, P., S. & W. Co. 20¢ to 25¢
 Rice Hand Punches 15¢
 Avery's Revolving 40¢
 Avery's Saw and Punch-See Sawsets
 Niagara Hollow Punches 20¢ to 25¢
 Niagara Solid Punches 55¢

Rail-

Sliding Door, Wrt Brass \$ doz. 85¢, 40¢
 Sliding Door, Bronzed Wrt Iron, 1 ft. 7¢
 Sliding Door, Iron, Painted, 1 ft., 5¢, 40¢
 Barn Door, Light, 1 in. 2 in. 3 in. 4 in. 5 in. 6 in. 7 in. 8 in. 9 in. 10 in. 11 in. 12 in. 13 in. 14 in. 15 in. 16 in. 17 in. 18 in. 19 in. 20 in. 21 in. 22 in. 23 in. 24 in. 25 in. 26 in. 27 in. 28 in. 29 in. 30 in. 31 in. 32 in. 33 in. 34 in. 35 in. 36 in. 37 in. 38 in. 39 in. 40 in. 41 in. 42 in. 43 in. 44 in. 45 in. 46 in. 47 in. 48 in. 49 in. 50 in. 51 in. 52 in. 53 in. 54 in. 55 in. 56 in. 57 in. 58 in. 59 in. 60 in. 61 in. 62 in. 63 in. 64 in. 65 in. 66 in. 67 in. 68 in. 69 in. 70 in. 71 in. 72 in. 73 in. 74 in. 75 in. 76 in. 77 in. 78 in. 79 in. 80 in. 81 in. 82 in. 83 in. 84 in. 85 in. 86 in. 87 in. 88 in. 89 in. 90 in. 91 in. 92 in. 93 in. 94 in. 95 in. 96 in. 97 in. 98 in. 99 in. 100 in. 101 in. 102 in. 103 in. 104 in. 105 in. 106 in. 107 in. 108 in. 109 in. 110 in. 111 in. 112 in. 113 in. 114 in. 115 in. 116 in. 117 in. 118 in. 119 in. 120 in. 121 in. 122 in. 123 in. 124 in. 125 in. 126 in. 127 in. 128 in. 129 in. 130 in. 131 in. 132 in. 133 in. 134 in. 135 in. 136 in. 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Snaps, Harness, &c.

Anchor (1, S. Mfg. Co.)	50¢
Fitch's Bristol	50¢
Hutchings	10¢
Andrews	50¢
Sargent's Patent Guarded	70¢
German, new list	40¢
Covert	50¢
Covert, New Patent	50¢
Covert, New R. E.	50¢
Covered Spring	60¢
Covert's Saddlery Works' Triumph	33¢
John's Snaps	75¢
Kelley & Woolworth's Steel Harness	50¢

Snaths

Scythe	50¢
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Soldering IronsSee *Irons, Soldering*.**Spittons, Cuspidors, &c.****Standard Fiberware**

Cuspidors, 8 1/2-inch, 1/2 doz., No. 5, 8; No. 5, 8

Spittons, Daisy, 8-inch, No. 1, 1; 10 and 11 inch, 10

Spoke ShavesSee *Shaves, Spoke*.**Spoke Trimmers**See *Trimmers, Spoke*.**Spoons and Forks****Tinned Iron**

Basting, Cen. Stamp. Co.'s list, 70¢

Solid (table and Tea, Cen. Stamp. Co.'s list, 70¢

Buffalo, S. S. & Co., 85¢

Silver Plated

4 months or 5¢ cash 30 days:

Meriden Brl. Co., Rogers, 40¢

C. Rogers & Bros, 40¢

Rogers & Bros, 40¢

Reed & Barton, 40¢

Wm. Rogers Mfg. Co., 40¢

Simpson, Hall, Miller & Co., 40¢

Holmes & Edwards Silver Co., 40¢

L. Boardman & Son, 50¢

Miscellaneous

Holmes & Edwards Silver Co., 50¢

No. 1 Mexican Silver, 50¢

No. 30 Silver Metal, 50¢

No. 24 German Silver, 50¢

No. 50 Nickel Silver, 50¢

No. 49 Nickel Silver, 50¢

Wm. Rogers Mfg. Co., 50¢

Rogers Silver Metal, 50¢

18¢ Rogers' German Silver, 60¢

22¢ Rogers' Nickel Silver, 50¢

German Silver, 50¢

German Silver, Hall & Elton, 50¢

Nickel Silver, 50¢

Britannia, 60¢

Boardman's Nickel Silver, list July 1, 60¢

Boardman's Britannia Spoons, case lots, 60¢

Spring

Torrey's Rod, 39 in., 1/2 doz., 1.20

Warner's No. 1, 1/2 doz., 1.50

Gem (Coil), list April 19, 1888, 20¢

Star (Coil), list April 19, 1888, 20¢

Victor (Coil), 10¢

Champion (Coil), 60¢

Cowell's No. 1, 1/2 doz., 1.80

Rubber, complete, 1/2 doz., 4.50

Hercules, 50¢

Phoenix, 39¢

Marriage, Wagon, &c.

Elliptic, Concord, Platform and Half

Cliff's Bolster Springs, 25¢

Squares

Steel and Iron, 80¢

Nickel Plated, 80¢

Try Square and T Bevels, 80¢

Disston's Try Square and T Bevels, 50¢

Winterbottom's Try and Miter, 30¢

Starrett's Micrometer Caliper Squares, 25¢

Avery's Flush Bevel Squares, 40¢

Avery's Bevel Protractor, 50¢

Squeezers**Fodder**

Blair's, 1/2 doz., 2.00

Blair's "Climax", 1/2 doz., 1.25

Lemon

Porcelain Lined, No. 1, 1/2 doz., 3.00

Wood, No. 2, 1/2 doz., 3.00

Wood, Common, 1/2 doz., 1.70

Dunlap's Improved, 1/2 doz., 3.75

Sammis' No. 1, 1/2 doz., 3.75

Jennings' Star, 1/2 doz., 2.50

The Boss, 1/2 doz., 2.50

Dean's, No. 1, 1/2 doz., 3.35

Little Giant, 1/2 doz., 5.00

Kline, 1/2 doz., 4.00

Hutchings Straight Flash, 1/2 doz., 12.00

Silver & Co. Glass, 1/2 doz., 9.00

Standard Fiber WareSee *Ware, Standard Fiber*.**Staples**

Barbed Blind, 1/2 in. and larger, 1/2 doz., 7.44

Barbed Blind, 1/2 in., 1/2 doz., 8.34

Fence Staples, Galvanized, Same price

Fence Staples, Plain, See *Trd. Wire*

Grand Crossing Tack Co.'s list, 75¢

Steelyards**Stocks and Dies**

Blacksmith's, 35¢

Waterford Goods, 35¢

Butterfield's Goods, 35¢

Lightning Screw Plate, 25¢

Reece's New Screw Plates, 25¢

Reversible Ratchet, 25¢

Gardner, 25¢

Green River, 25¢

Stops, Bench

Morrill's, 1/2 doz., No. 1, 10.00

Hutchings, 1/2 doz., 5.10

Hutchings, No. 1, 10.00

McGill's, 1/2 doz., 3.00

Cincinnati, 25¢

Terrell's Nos. 1 and 2, 1/2 doz., 3.00

Stellar's Falls, 25¢

Stellar's, 20¢

Stone**Grind-See Grindstones****Scythe Stones**

Pike Mfg. Co., list April, 1892, 33¢

Cleveland Stone Co., list Nov. 1892, 33¢

Oil Stones, &c.

Pike Mfg. Co.:

Hindustan No. 1, 1/2 doz., 8¢

Sand Stone, 40¢

Turkey Oil Stone, 4 to 8 in., 10¢

Turkey Slips, 3.00

Lily White Washita, 60¢

Rosy Red Washita, 60¢

Washita Stone, Extra, 50¢

Washita Stone, No. 1, 40¢

Washita Stone, No. 2, 50¢

Lily White Slips, 30¢

Rosy Red Slips, 30¢

Washita Slips, Extra, 70¢

Washita Slips, No. 1, 70¢

Arkansas Stone, No. 1, 3 to 5 in., 5¢

Arkansas Stone, No. 1 1/2 to 3 in., 5¢

Lake Superior, 1/2 doz., 13¢

Lake Superior Slips, 1/2 doz., 20¢

Stove PolishSee *Polish, Stove*.**Stretchers Carpet**

Cast Steel, Polished, 1/2 doz., 2.3

Cast Iron, Steel Points, 1/2 doz., 75¢

Socket, 1/2 doz., 1.75

Bullard's, 25¢

Strops, Razor

Genuine Emerson, 60¢

Imitation, 1/2 doz., 2.00

Torrey's, 20¢

Badger's Belt and Com., 1/2 doz., 2.00

Lamont Combination, 1/2 doz., 4.00

Jordan's Pat. Padded, list Nov. 1, 89, 50¢

Electric Cutlery Co., Net

Campbell Cutlery Co., Net

Stuffer, Sausage

Miles' Challenge, 1/2 doz., 50¢

Perry, 1/2 doz., No. 1, 15.00

Enterprise Mfg. Co., list Jan. 17, 93, 25¢

Sweepers, Carpet and Lawn**Carpet**

Bissell No. 5, 1/2 doz., 17.00

Bissell No. 8, 1/2 doz., 20.00

Bissell, Grand, 1/2 doz., 30.00

Standard, 1/2 doz., 34.00

Domestic, 1/2 doz., 32.00

Domestic, No. 2, 1/2 doz., 32.00

Grand Rapids, 1/2 doz., 34.00

Crown Jewel, No. 1, 18.00

Crown Jewel, No. 2, 19.00

Magie, 1/2 doz., No. 3, 20.00

Improved Parlor Queen, 1/2 doz., 27.00

Jannaped, 1/2 doz., 24.00

Excelsior, 1/2 doz., 32.00

Garland, 1/2 doz., 18.00

Parlor Queen, 1/2 doz., 24.00

Housewife's Delight, 1/2 doz., 15.00

Ladies' Friend, 1/2 doz., 15.00

Ladies' Friend No. 2, 1/2 doz., 15.00

Advance, 1/2 doz., 18.00

Our Leader, 1/2 doz., 19.00

Triumph, 1/2 doz., 20.00

Supreme, 1/2 doz., 22.00

Easy, Jap'd, 1/2 doz., 22.00

Gilt Edge, 1/2 doz., 24.00

Imperial, 1/2 doz., 26.00

Grand Republic, 1/2 doz., 30.00

Banner, 1/2 doz., 22.00

The Star, 1/2 doz., 21.00

Rapid, 1/2 doz., 22.00

Rapid Jap'd, 1/2 doz., 22.00

Our Own, 1/2 doz., 27.00

Model, 1/2 doz., 27.00

Goshen Sweeper Company, Grand

Rapids, Mich., make the following re-

bates:

American in 6 months, 1/2 doz., 1.00

American in 6 months, 1/2 doz., 2.00

Exception L.F., when 10 dozen price is

13.50, and 25 dozen 13.00.

Lawn

Thompson Mfg. Co., 30¢

Swings

Davies Lawn, 25¢

Tacks, Brads &c.

List October 19, 1893. Old established

straight Weights. Short Weight goods

are sold at lower prices.

Carpet Tacks

American, Blued, 66¢

American, Tinned and Cop'd, 70¢

Lancaster, Bright and Blued, 66¢

Steel, Tinned and Cop'd, 70¢

Swedes Iron, Blued, 72¢

Swedes Iron, Tinned, 75¢

American Iron Tacks, Domestic, 66¢

Swedes Iron Tacks—

S. S., Blued, 66¢

S. S., Tinned, 70¢

Lanc., Blued, 66¢

Lanc., Tinned, 70¢

Gimp and Lace Tacks—

S. S., Blued, 62¢

S. S., Tinned, 66¢

Lanc., Blued, 66¢

Lanc., Tinned, 70¢

Basket and Trimmers' Tacks—

Lanc., 52¢

S. S., 55¢

Hungarian Nails, 60¢

Common and Patent Brads, 55¢

Lancaster Tacks, 55¢

Brush Tacks, S. S., 60¢

Looking Glass Tacks, S. S., 85¢

Picture-Frame Points, S. S., 35¢

Finishing Nails, 60¢

Trunk and Clout Nails—

Black, 65¢

Tinned or Cop'd, 67¢

Basket Nails, 60¢

Chair Nails, 62¢

Cigar Box Nails, 45¢

Tin Capped Nails, 60¢

Miscellaneous

Double Point, 90¢

Wire Carpet Nails, 60¢

Claw Handle Carpet, 70¢

Bonnie Blue, 1/2 box 45.00

Bill Nye Brad Box

Parisian Gilt Nails, cartoon, 50¢

Home Tacks, No. 50 1/2 case (12 car-

tons), 35¢

Home Nails, No. 300, 1/2 case (12 car-

tons), 30.00

Upholsterers' Nails, 50¢

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list, 50¢

See also Nails, Wire**Tanks, Oil**

Emerald, S. S. & Co.: 30-gal., \$8.75; 60-

gal., \$11 each, 50¢

Tapes, Measuring

American, 40¢

Spring, 40¢

Chesterman's, Regular list, 25¢

Thermometers

Tin Case, 80¢

Thimble Skelns—See Skelns**Ties, Bale—Steel**

Standard Wire, list, 50¢

Tinners' Shears, &c.See *Shears, Tinners' &c.***Tinware**

Stamped, Jannaped and Piced, list

Jan. 20, 1887, 70¢

Tire Benders, Upsetters, &c.See *Benders and Upsetters***Tobacco Cutters**See *Cutters, Tobacco*.**Tools—Coopers'**

Bradley's, 20¢

Barton's, 20¢

Whips

American Whip Co.: Length.	4 1/2	5	6	6 1/2	7	7 1/2	8 ft.
X. L. Whalebone Driving.....	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00 36.00
Eureka, Two-thirds Whalebone.....	15.00	16.50	18.00	20.00			
Bull Bone, Half-length Whalebone.....			11.00	12.00	13.00	15.00	16.50
American Standard.....	8.00	8.50	9.50	10.50	12.00	13.50	15.00 16.50
True Grip, Raw Hide Center.....	6.00	6.00	6.50	7.00	7.50	8.00	
New Name, Stocked Java, Black and Wine Colors.....			6.00				
American, 88 Pen Whip.....			6.00				
Gents' Light Driving No. 111.....			6.00				
Gents' Light Driving No. 106.....			6.00				
Hand-made Stocked Java No. 103.....			8.75	4.00			
A large variety of cheaper grades.....							50¢@\$.30
Team Whips.....							\$2.00@\$.75
Toy Whips.....							\$1.00@\$.50
Hardware Assortment, 10/American, 75 Whips for \$50.00.							\$2.50@\$.12.00

Per dozen.

Wire and Wire Goods—**Iron—****Market,**

Br. & Ann., Nos. 0 to 18.....	75¢@1.00	75¢@1.00
Cop'd, Nos. 0 to 18.....	75¢@1.00	75¢@1.00
Galv., Nos. 0 to 18.....	75¢@1.00	75¢@1.00
Tin'd, Tin'd, Nos. 0 to 18.....	75¢@1.00	75¢@1.00

Extra 5¢@10¢
often given
prices often
made on
large lots.

Stone, Br. and Ann'd, Nos. 16 to 18.....	80¢	Extra 10¢
Nos. 19 to 26.....	80¢	often given.
Nos. 27 to 38.....	80¢	
Tinned Broom Wire, 18 to 21, 1/2".....	45¢	
Galvanized Fence.....	75¢@1.00	
Brass, 1st Jan. 18, 1884.....	40¢@50¢	
Copper, 1st Jan. 18, 1884.....	40¢@50¢	
Ann'd Wire on Spools.....	60¢@85¢	
Mallin's Ann'd & Tin'd on Spools.....	60¢@85¢	
Mallin's Brass and Cop. on Spools.....	60¢@85¢	
Ossawan Mills, Ann'd and Tinned on Spools.....	60¢@85¢	

Ossawan Mills, Brass and Copper on Spools..... 50¢@1.00
Tate's Spooled, Tin'd & Annealed..... 60¢@85¢
Tate's Spooled Cop. and Brass..... 50¢
Cast Steel Wire..... 50¢
Stubs' Steel Wire..... 50¢
Steel Music Wire, 12 to 30, imported..... 60¢@70¢

Wire Clothes Line, see Lines.

Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard 1st..... 85¢@1.00
Wire Cloth and Netting—
Painted Screen Cloth 100 ft..... \$1.75
Galvanized Wire Netting..... 75¢@75¢@1.00

Wire Barb—

See Trade Report.

Wire Rope—See Rope, Wire.**Wrenches—**

American Adjustable..... 40¢
Baxter's Adjustable "g"..... 40¢@50¢
Baxter's Diagonal..... 60¢
Coe's Genuine..... 50¢@50¢@1.00
Coe's "Mechanics"..... 50¢@1.00
Girard Standard..... 65¢@1.00
Lamson & Sessions' Engineers'..... 60¢@1.00
Lamson & Sessions' Standard..... 70¢@1.00
P. S. & W. Agricultural..... 75¢@1.00
Girard Agricultural..... 75¢@1.00
Lamson & Sessions' Agric'l..... 75¢@1.00
W. & B. Diamond..... 75¢@1.00

Bemis & Call's:
Pat. Combination Bright..... 40¢@50¢
Pat. Combination Black..... 40¢@50¢
Merrick's Pattern..... 40¢
Briggs' Pattern..... 30¢@50¢
Cylinder or Gas Pipe..... 45¢@50¢
No. 3 Pipe..... 55¢
Aiken's Pocket (Bright)..... 36.00, 50¢@1.00
The Favorite Pocket..... 2 doz., \$4.00, 40¢
Webster's Pat. Combination..... 30¢
Boardman's..... 25¢@50¢
Always Ready..... 25¢@50¢
Alligator..... 50¢
Donohue's Engineer..... 20¢@1.00
Eagle..... 50¢@1.00
Acme, Bright..... 50¢@50¢
Acme, Nickel'd..... 70¢@70¢@50¢
Walker's..... 55¢@50¢
Diamond Steel..... 55¢@50¢
Cincinnati Brace Wrencher..... 25¢@1.00
Tate's Vise Wrench..... 55¢@1.00

Wringers, Clothes

Am. Wringer Co.'s 1st, July 1, '98..... 2% cash
Colby Wringer Co., 1st Sept. 1, '98..... 2% cash
Lovell Mfg. Co., 1st July 1, 1892..... 2% cash
Peelless Mfg. Co., 1st Feb. 1897..... 2% cash
National Wringer & Mfg. Co., 1st June 1, 1892..... 2% cash

Wrought Goods—

Staples, Hooks, &c., 1st, March 17, 1892..... 85¢@1.00@85¢@1.50

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw.....	40	40
Linseed, City, boiled.....	43	43
Linseed, Western, raw.....	38	40
Lard, City, Extra Winter.....	75	77
Lard, City, Prime.....	75	75
Lard, City, Extra No. 1.....	75	75
Lard, City, No. 1.....	75	75
Lard, Western, prime.....	75	75
Cotton-seed, Crude, prime.....	34	36
Cotton-seed, Crude, off grades.....	32	34
Cotton-seed, Summer Yellow, prime.....	39	40
Cotton-seed, Summer Yellow, off grades.....	36	37
Sperm, Crude.....	70	77
Sperm, Natural Spring.....	75	77
Sperm, Bleached Spring.....	80	82
Sperm, Natural Winter.....	81	82
Sperm, Bleached Winter.....	80	88
Whale, Crude.....	48	50
Whale, Natural Winter.....	51	52
Whale, Bleached Winter.....	51	52
Whale, Extra Bleached.....	51	52
Sea Elephant, Bleached Winter.....	55	55
Menhaden, Crude, Southern.....	39	40
Menhaden, Light Pressed.....	39	40
Menhaden, Bleached Winter.....	43	43
Menhaden, Extra Bleached.....	46	46
Tallow, City, prime.....	60	60
Tallow, Western, prime.....	55	55
Cocanut, Ceylon.....	54	54
Cocanut, Ceylon.....	54	54
Cod, Domestic.....	38	40
Cod, Foreign.....	42	45
Red Elaine.....	44	46
Red Saponified.....	44	46
Bank.....	38	40
Olive, Italian, bbls.....	58	60
Neatsfoot, prime.....	75	80
Palm, prime, Lagos.....	74	84

Mineral Oils—

Black, 29 gravity, 25 to 30 cold test.....	7	7 1/2
Black, 29 gravity, 15 cold test.....	7 1/2	8
Black, 29 gravity, summer.....	6	8 1/2
Cylinder light, filtered.....	14	16

Cylinder, dark, filtered.....	10	13
Paraffine, 23 1/2 to 24 gravity.....	11	12
Paraffine, 25 gravity.....	10	11
Paraffine, 28 gravity.....	7 1/2	8
Paraffine, red.....	1 1/2	10 1/2

Paints and Colors—

Barytes, Foreign, 1/2 ton.....	\$22.00	\$24.00
Barytes, Amer. loaded.....	29.00	\$32.00
Barytes, Amer. No. 1.....	16.00	18.00
Barytes, Amer. No. 2.....	13.00	15.00
Barytes, Amer. No. 3.....	11.00	12.00
Blue, Celestial.....	6	8
Blue, Chinese.....	25	40
Blue, Prussian.....	40	50
Blue, Ultramarine.....	8	25
Brown, Spanish.....	3	3 1/2
Brown, Vandyke, Amer.....	3	3 1/2
Brown, Vandyke, English.....	6	8
Carmine, No. 40, in bulk.....	2.75	
Carmine, No. 40, in boxes.....	2.85	
Carmine, No. 40, in ounce bottles.....	3.75	
Chalk, in bulk.....	1.75	2.00
Chalk, in bbls., 100 lb.....	33	40
China Clay, English.....	13.00	\$18.00
Cobalt Oxide, prep'd.....	9.00	\$11.00
Cobalt Oxide, black.....	1.90	
Cobalt Oxide, black, less 100 lb.....	1.90	
Green, Paris, in bulk.....	10	10 1/2
Green, Paris, 170 to 175.....	10 1/2	11
Green, Paris, small pack.....	12	17
Green, Chrome, ordinary.....	6	12
Green, Chrome, pure.....	22	25
Lead, Eng., B.B. white.....	8 1/2	10
Lead, Amn. White, dry or in oil.....	7	7 1/2
Kegs, lots less than 500 lb.....	6 1/2	6 3/4
Kegs, lots 500 lb to 5 tons.....	6 1/2	6 3/4
Kegs, lots 5 tons to 12 tons.....	6 1/2	6 3/4
Kegs, lots 12 tons and over.....	6 1/2	6 3/4
Lead, White, in oil, 25 lb tin.....	6 1/2	6 3/4
Lead, White, in oil, 25 lb tin, pails, add to keg price.....	6 1/2	6 3/4
Lead, White, in oil, 1 to 5 lb assorted tins, add to keg price.....	6 1/2	6 3/4
Lead, Red, bbls, and 1/2 bbls.....	6	7
Lead, Red, kegs.....	8 1/2	7 1/2
Litharge, kegs.....	6 1/2	7 1/2
Litharge, bbls, and 1/2 bbls.....	6	7

TERMS, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2 1/2 % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	1 1/2
Ocher, French.....	1 1/2	2
Ocher, German Washed.....	1 1/2	2
Ocher, American.....	1 1/2	2
Orange Mineral, English.....	8 1/2	9
Orange Mineral, French.....	10	10 1/2
Orange Mineral, German.....	8 1/2	9
Orange Mineral, American.....	8 1/2	9
Paris White, English Cliff.....	1.00	@1.15
Paris White, American.....	65	@75
Red, Indian, English.....	5 1/2	7
Red, Indian, American.....	2	@ 6 1/2
Red, Turkey.....	9	@ 14
Red, Tuscan.....	9	@ 11
Red, Venetian, American.....	100 lb.....	1.00 @1.10
Red, Venetian, English.....	1.20	@1.35
Sienna, Italian, Burnt and Powd.....	4	@ 5
Sienna, Ital., Burnt Lumps.....	1 1/2	@ 3 1/2
Sienna, Ital., Raw, Powd.....	4 1/2	@ 5 1/2
Sienna, Ital., Raw, Lumps.....	1 1/2	@ 3 1/2
Sienna, American, Raw.....	1 1/2	@ 3 1/2
Sienna, American, Burnt and Powd.....	1 1/2	@ 3 1/2
Talc, French.....	1 1/2	@ 1 1/2
Talc, American.....	1 1/2	@ 1 1/2
Terra Alba, R'w Lumps.....	95	@1.25
Terra Alba, English.....	70	@80
Terra Alba, American No. 1.....	65	@75
Terra Alba, American No. 2.....	45	@50
Umber, Turkey, Burnt and Powd.....	3 1/2	@ 4
Umber, Turkey Bnt. Ln.....	2 1/2	@ 3
Umber, Turkey, Raw and Powd.....	3 1/2	@ 4
Umber, Turkey, R'w Lumps.....	2 1/2	@ 3 1/2
Umber, Turkey, Bnt. Amer.....	1 1/2	@ 1 1/2
Umber, Turkey, R'w Amer.....	1 1/2	@ 1 1/2
Yellow, Chrome.....	10	@ 25
Vermilion, American Lead.....	11 1/2	@ 12
Vermilion, Quicksilver, bags.....	57	
Vermilion, Quicksilver sm'r.....	58	
Vermilion, English Import.....	82	
Vermilion, Imitation, Eng.....	85	@ 90
Vermilion, Trieste.....	8	@ 35
Vermilion, Chinese.....	90	@ 95
Vermilion, Common, 100 lb.....	37 1/2	@ 42 1/2
Whiting Gliders.....	45	@ 55

Zinc, American, dry..... 4 @ 4 1/2
Zinc, French, Red Seal..... 7 1/2 @
Zinc, French, Green Seal..... 9 @
Zinc, French, V. M. X..... 7 @
Zinc, Antwerp, Red Seal..... 7 1/2 @
Zinc, Antwerp, Green Seal..... 7 1/2 @
Zinc, German, L. Z. O..... 6 1/2 @ 7 1/2
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over..... 10 1/2 @ 11 1/2
lots less than one ton..... 11 @ 11 1/2
Zinc, V. M. in Poppy Oil, Red Seal, lots of 1 ton and over..... 10 @ 10 1/2
lots less than 1 ton..... 10 1/2 @ 10 1/2
Discourts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1 1/2 to 2 1/2; 50 bbls. 4%. No discount allowed on less than bbl. lots.

Colors in Oil—

Black, Drop, Frankfurt.....	25	@ 30
Black, Drop, English.....	12	@ 15
Black, Drop, Drestle.....	7	@ 10
Black, Lampblack, Best.....	20	@ 35
Black, Lampblack, Common.....	7	@ 13
Black, Ivory.....	8	@ 15
Blue, Chinese.....	35	@ 40
Blue, Prussian.....	20	@ 45
Blue, Ultramarine.....	12	@ 18
Brown, Vandyke.....	7	@ 12
Green, Chrome.....	8	@ 13
Green, Paris.....	16	@ 18 1/2
Sienna, Raw.....	7	@ 14
Sienna, Burnt.....	7	@ 14
Umber, Raw.....	7	@ 10
Umber, Burnt.....	7	@ 10

Putty—

In barrels and 1/2 bbls.....	.013¢	@ .013¢
In tubs.....	.013¢	@ .013¢
In tin cans.....	.013¢	@ .02 1/2
In bladders.....	.013¢	@ .02 1/2

Spirits Turpentine

In regular bbls.....	@ 29 1/2
In machine bbls.....	@ 30

Glue—

Low Grade.....	8	@ 10
Cabinet.....	12	@ 14
Medium White.....	13	@ 15
Extra White.....	17	@ 20
French.....	10	@ 22
English.....	10	@ 15
Irish.....	12	@ 15

THE IRON AGE.

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" " 18 to 20.....

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Plates Command Quality.

IX, 20 x 28	12.50
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IX, 20 x 28	14.50

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Nos. 25 and 26.....	.22½	.23½	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28.....	.23	.24	.2	.28	.30	.32	.34	.36

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